

# Dasar Komputer

Prodi Pendidikan Ilmu Komputer  
FPMIPA UPI



**Komputer tersedia dalam berbagai macam bentuk dan ukuran, Pengguna dapat memilih sesuai dengan keinginan dan penggunaan sendiri.**



**Komputer Note Book, sering disebut “laptop” ini sangat populer dengan menggunakan daya rendah**



# Dasar Komputer



**Namun semua komputer memiliki fungsi bagian yang sama**



**Semua komputer menggunakan monitor, sebagai peralatan penampil, ini contoh diatas : CRT (cathode ray tube).**



**Layar datar LCD (liquid crystal display) merupakan salah satu tipe monitor.**

**Sama seperti yang dipakai di Laptop**





**Monitor Laptop  
berada pada tutup  
atasnya,  
menggunakan LCD.**



**Keyboard merupakan peralatan masukan.**





**Sebuah ergonomic keyboard.**

**Keyboard  
Laptop  
berada di  
bagian  
bawah.**





**Mouse, merupakan peralatan masukan.**



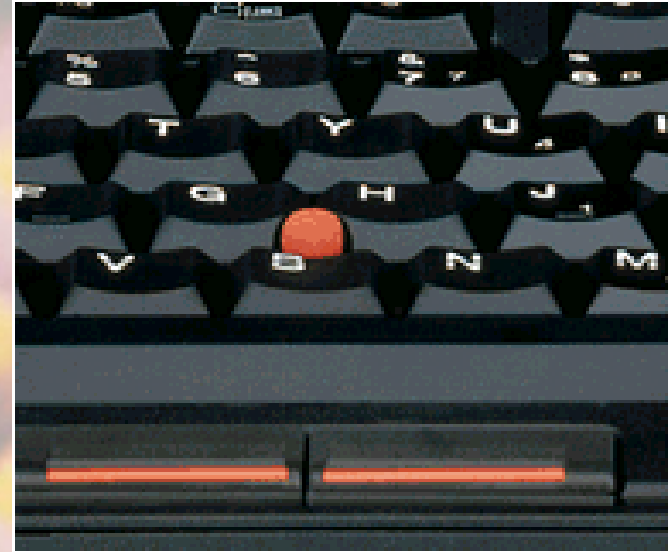


**Beberapa keyboard mempunyai trackball yang berfungsi sebagai mouse**

**Laptop mempunyai mouse yang menempel pada keyboard**



**Touchpad**



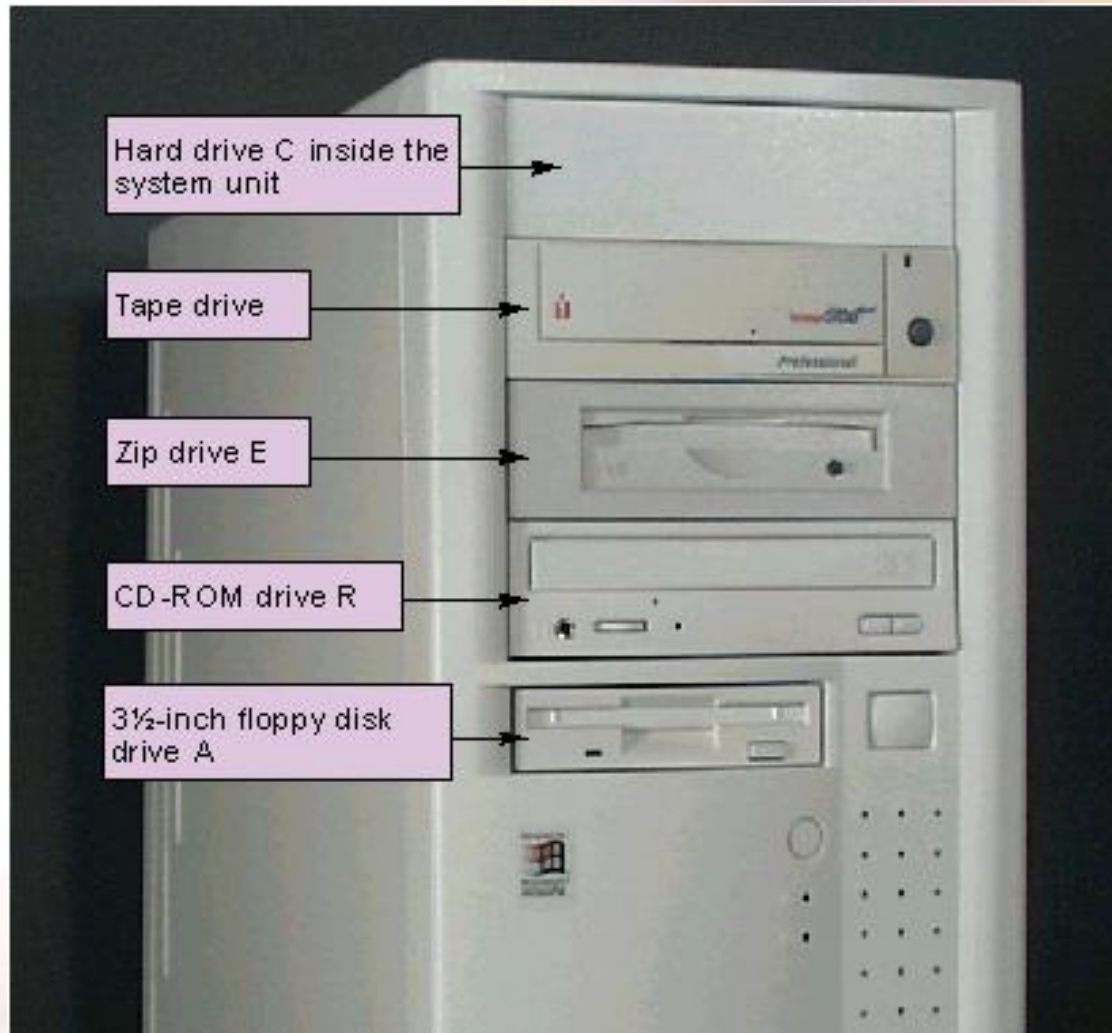
**Touchpoint**



**Sebuah sistem unit (CPU).**



# Dasar Komputer

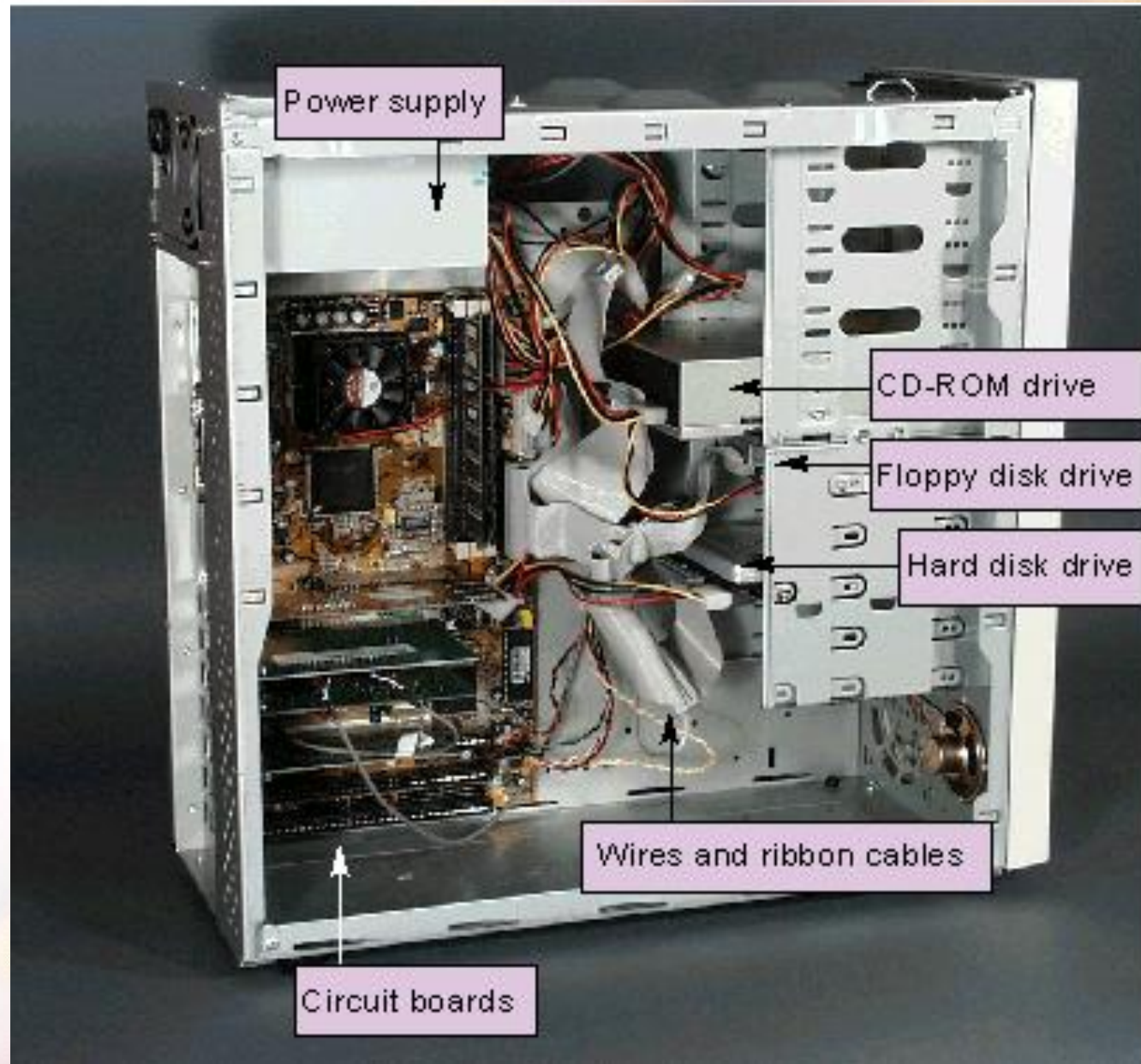


**Sistim unit merupakan tempat dari peralatan penyimpan dan peralatan transfer file, berada pada panel depan agar mudah dalam menggunakannya.**

- Sebuah sistem komputer unit mempunyai papan-papan rangkaian, sumber tegangan, dan peralatan penyimpanan.
  - Beberapa kabel dan kabel pita dari peralatan penyimpanan terhubung ke sumber daya dan papan rangkaian.
  - Port dan socket terhubung ke peralatan masukan dan keluaran (disebut peripheral devices).
  - Kipas pendingin komponen dan lampu indikator



# Dasar Komputer





**Pusat komponen dari unit sistim disebut motherboard, atau system board.**

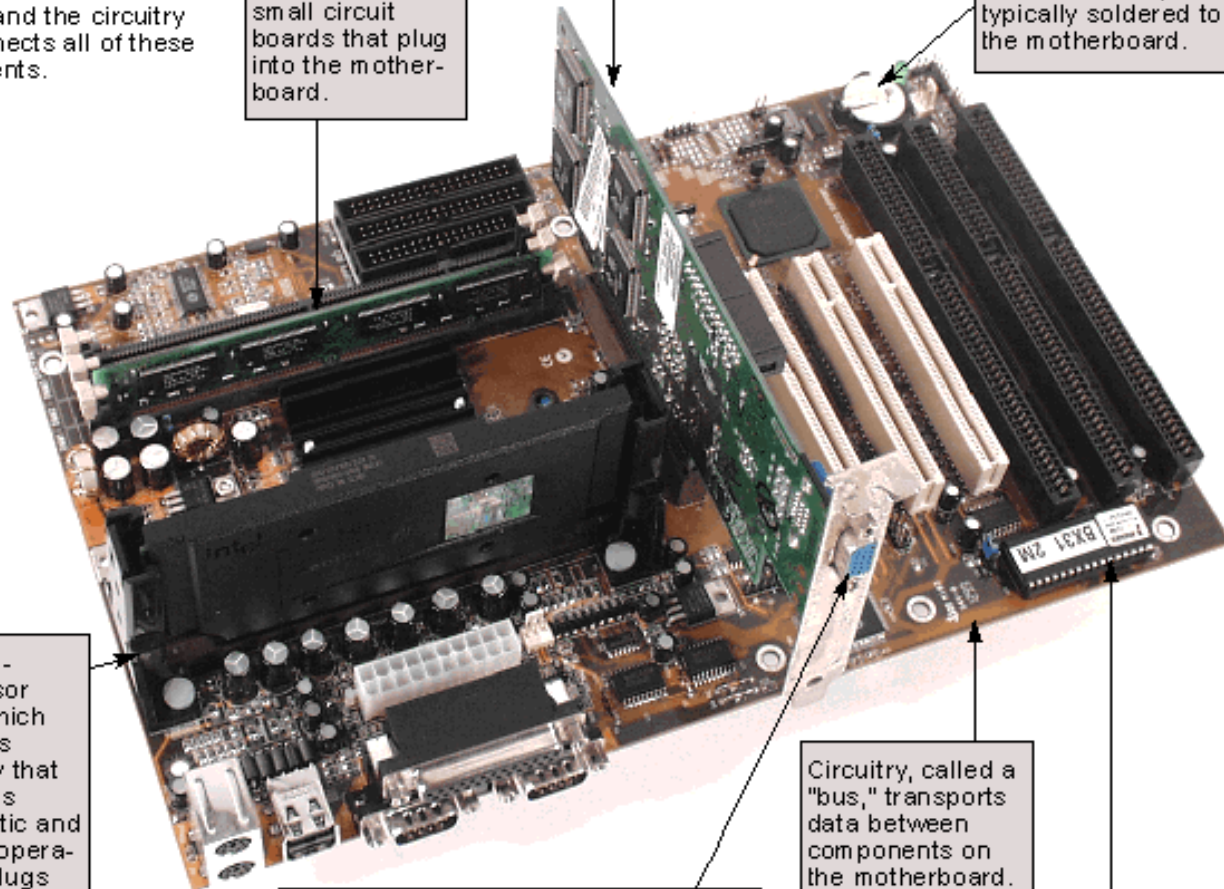
# Dasar Komputer

A computer motherboard provides sockets for chips, slots for small circuit boards, and the circuitry that connects all of these components.

Random access memory chips, which temporarily hold data, are mounted on small circuit boards that plug into the motherboard.

Some chips are mounted on a small circuit board called an "expansion card," which plugs into a long slot on the motherboard.

Support chips and other components, such as a battery for the computer's real-time clock, are typically soldered to the motherboard.



A micro-processor chip, which contains circuitry that performs arithmetic and logical operations, plugs directly into the motherboard.

Many expansion cards include a port, which provides a connection point for peripheral devices, such as a scanner or monitor.

Circuitry, called a "bus," transports data between components on the motherboard.

ROM chips contain the programs that start the computer, run system diagnostics, and control low-level input and output activities.

- Banyak komponen elektronik yang terdapat pada komputer, merupakan integrated circuits (ICs).





DIP (dual in-line pins) yang paling banyak dipakai. DIP memuat rangkaian spesial.



Bentuk lain IC adalah DIMM (dual in-line Memory Modules), digunakan pada RAM (Random Access Memory).





- **RAM** (Random Access Memory)
  - **Memori yang mudah berubah /diubah (volatile)**
  - **Menyimpan memori lebih dari satu putaran (cycle)**
  - **Memungkinkan CPU berfungsi sebagai alat bantu (tools)**





**Dapat digunakan untuk ROM (read-only memory), BIOS (basic input/output system).**

- **ROM (read-only memory) adalah memori yang tidak berubah/tetap**
  - **Menyimpan program instruksi walaupun sumber tegangan mati**
  - **Instruksi diset saat startup**
  - **BIOS (basic input/output system)**

- **C-MOS** (complementary metal oxide semiconductor)
  - **Menyimpan memori selama masih ada aliran listrik (baterai M/B)**
  - **Menyimpan set-up bagi PC**
  - **Memori dapat diubah-ubah oleh Pemakai (C-MOS setup)**



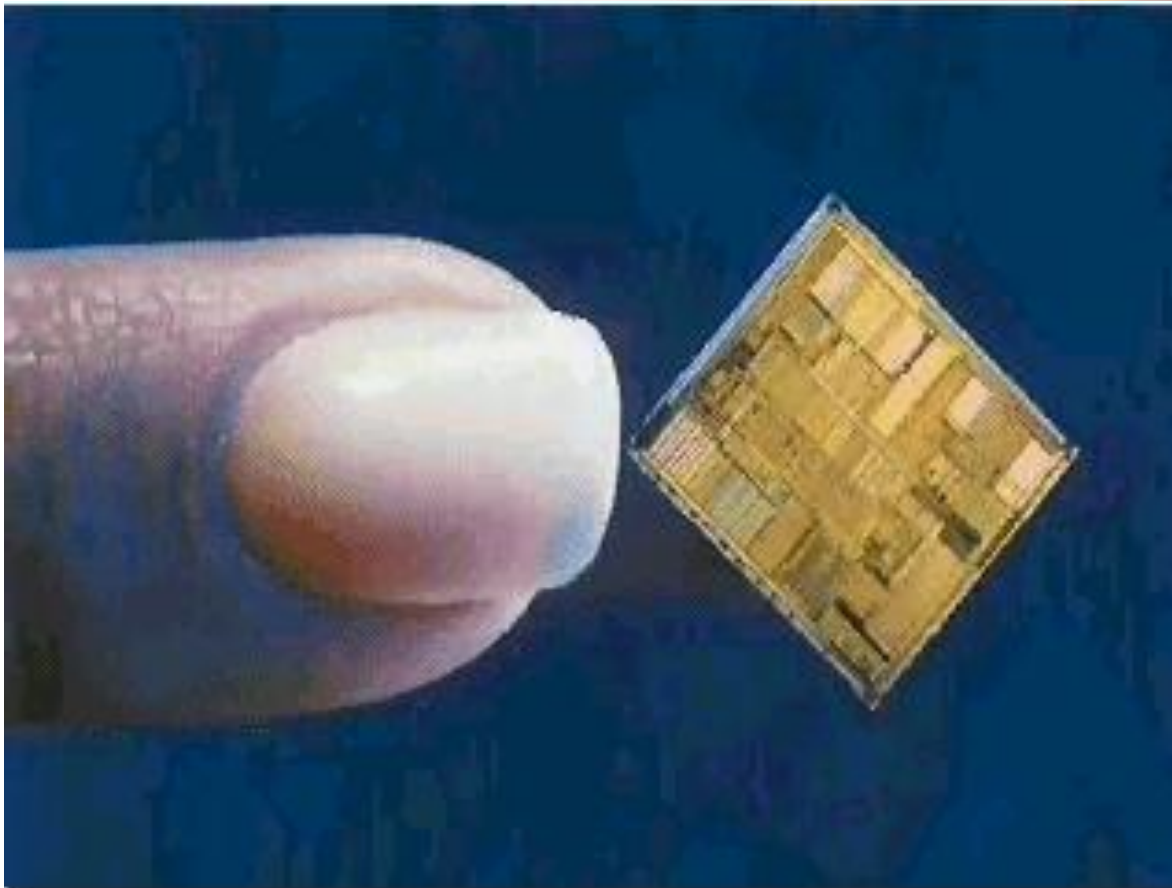
Masih adalagi IC, adalah PGA (pin-grid array) chip kemasan persegi yang digunakan untuk Rangkaian processing.



Kemasan processor yang agak lebih besar adalah SEC (single edge contact) cartridge dari Pentium III.

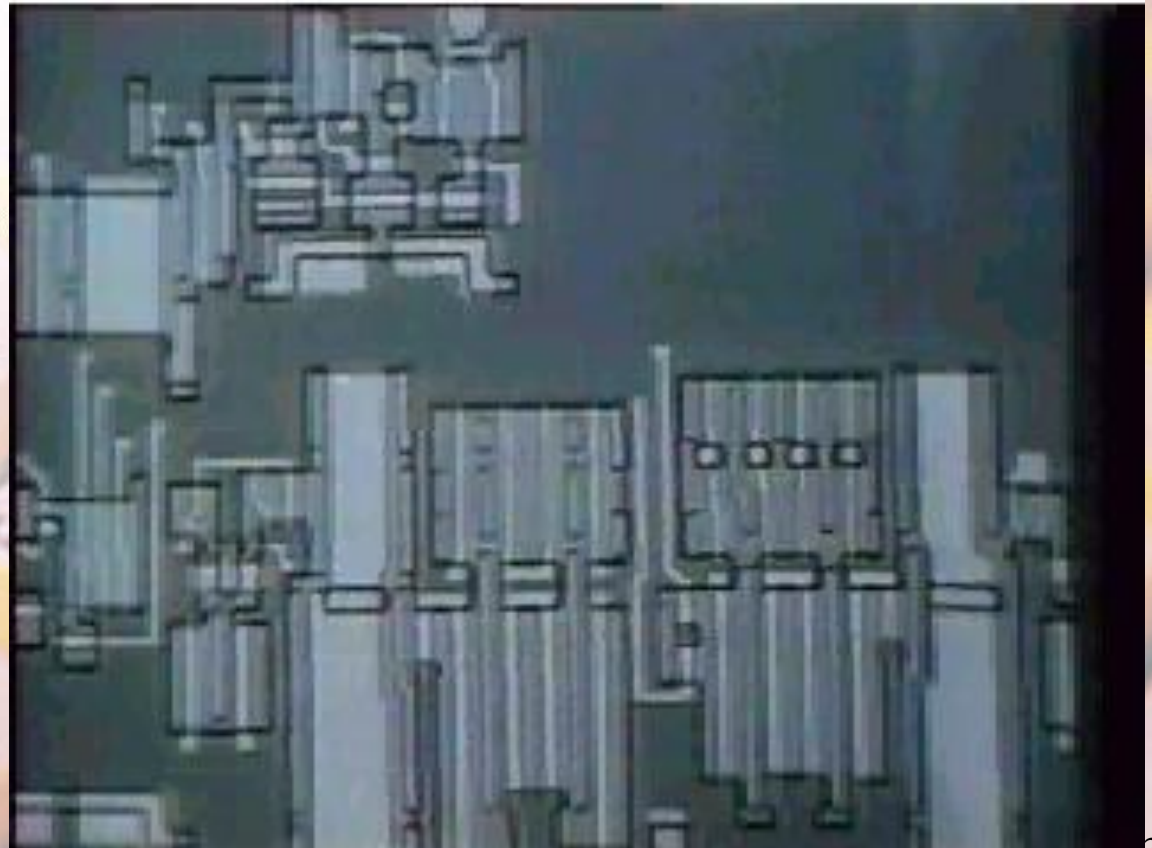


**Isi dalam sebuah IC dibandingkan dengan jari tangan kita.**





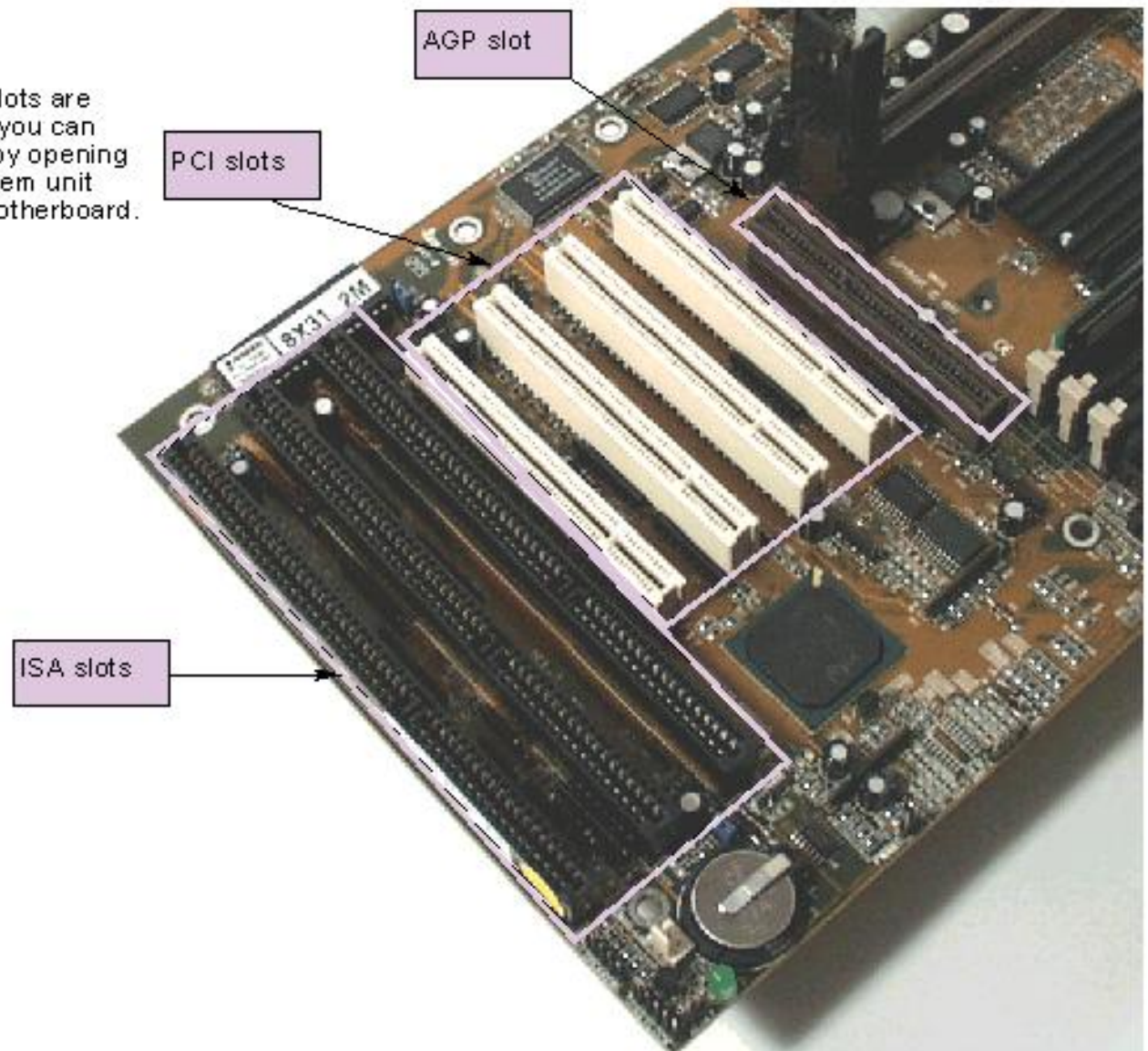
Di dalam chip IC terdapat jutaan transistors, resistors, dan komponen elektronik lainnya



**Pada Mother Board terdapat slot-slot untuk pengembangan card masukan atau keluaran semisal Video, Sound dan sebagainya.**

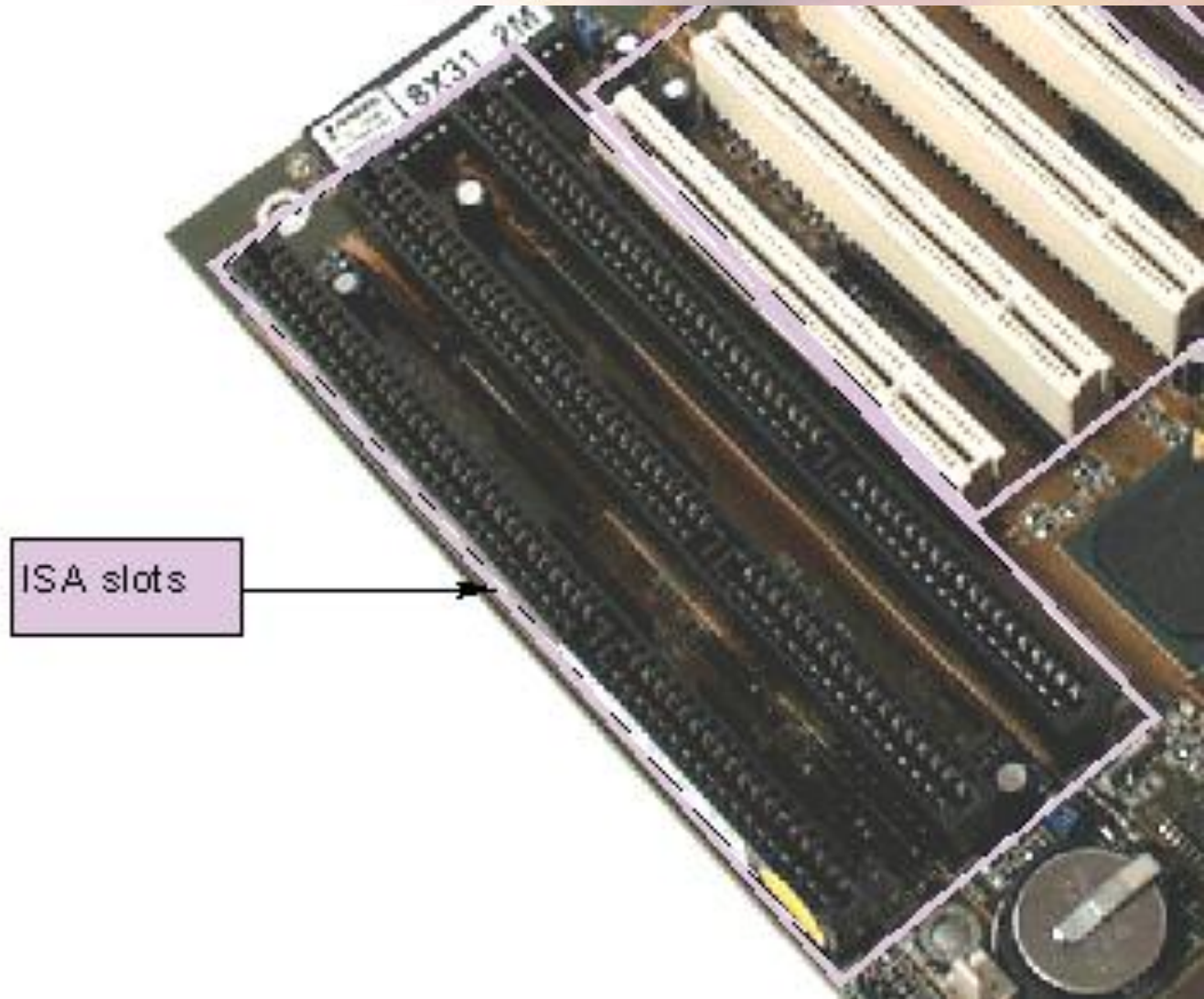
# Dasar Komputer

AGP, PCI, and ISA slots are different lengths, so you can easily identify them by opening your computer's system unit and looking at the motherboard.





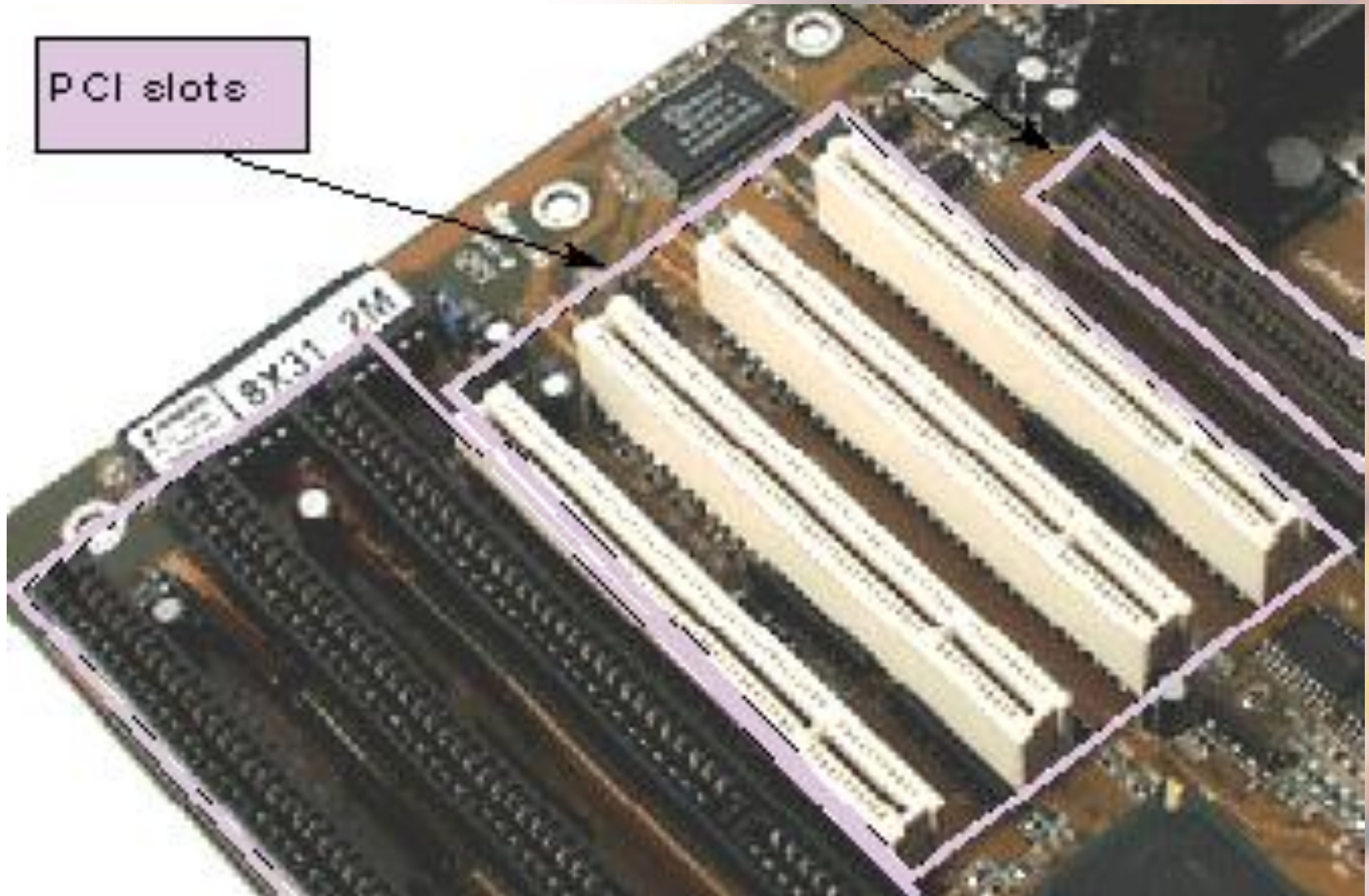
- **ISA (industry standard architecture).**
- **ISA slots adalah teknologi lama, masih digunakan hari ini untuk beberapa model modem dan peralatan yang mempunyai kecepatan rendah. Beberapa komputer baru, sudah tidak punya slot semacam ini.**



- **PCI (peripheral component interconnect).**
  - **PCI slots memungkinkan transfer data lebih cepat dengan 64-bit. Slot ini dirancang khusus untuk graphics card, sound card, video capture card, modem, atau network interface card (NIC).**



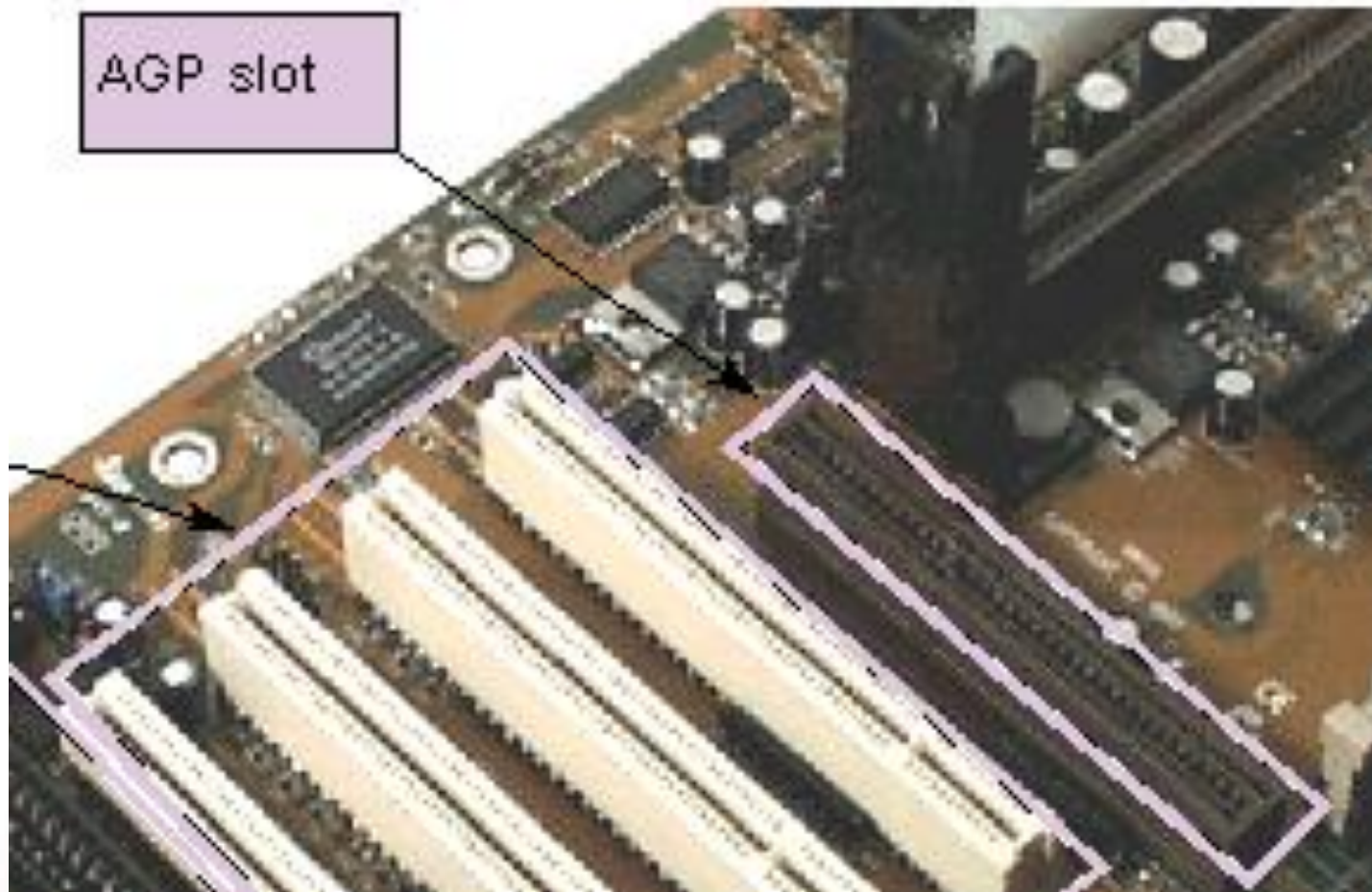
# Dasar Komputer



- **AGP (accelerated graphics port).**

- **Utamanya digunakan untuk graphics cards, dan lebih cepat daripada slot PCI. Slot AGP biasa digunakan untuk grafik 3-D.**





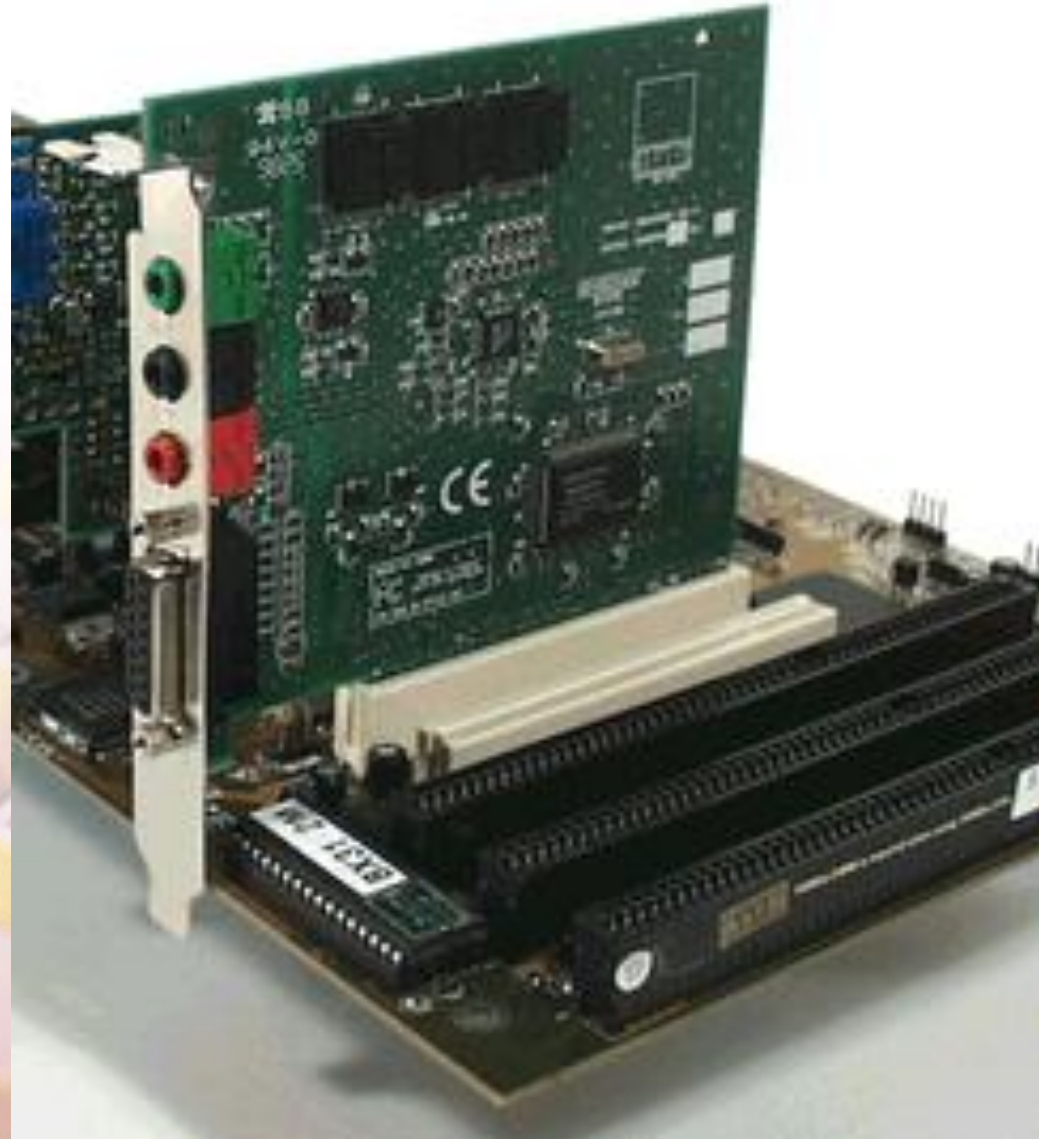


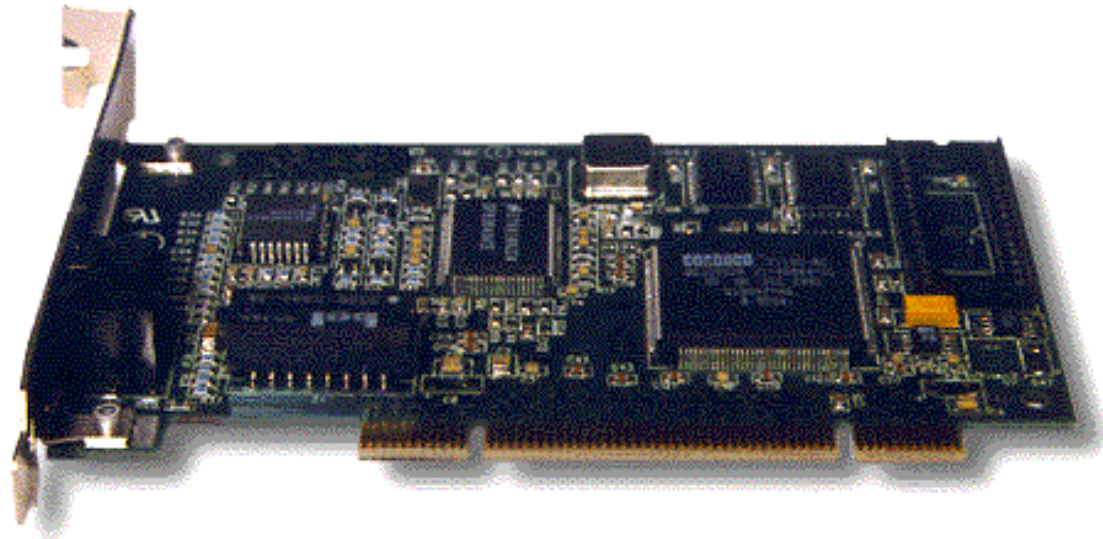
Ekspansi card mudah dipasang atau dimasukkan dalam slot.

**Video card**



**Sound card**





**A NIC (network interface card)**



# Dasar Komputer

An expansion card has a "card edge" connector with metal contacts that connect the circuitry on the card to the circuitry on the motherboard.



**Pemasangan ekspansi card sangat mudah, tinggal memasukkan pada slot yang sesuai**







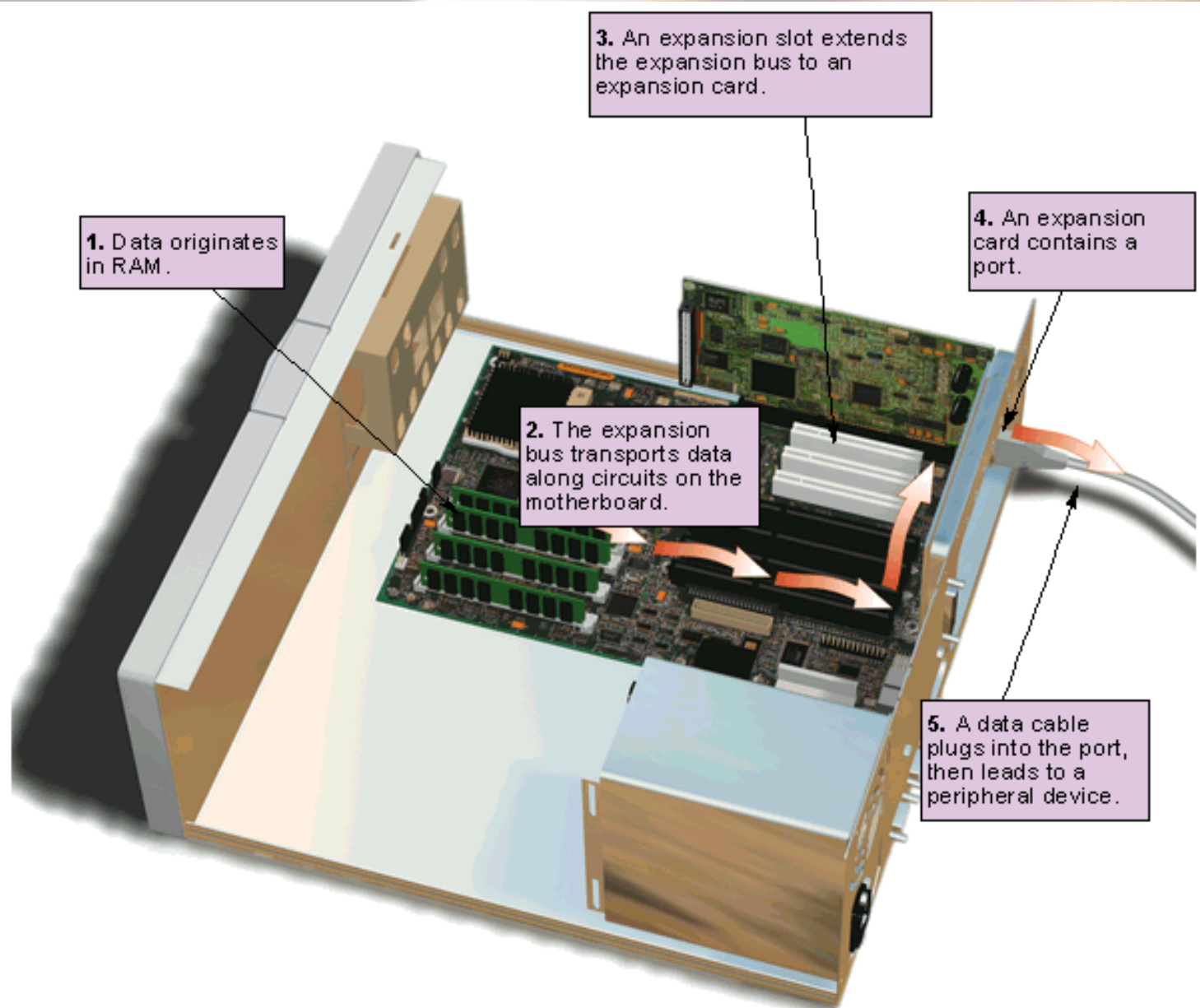
**Card ekspansi yang ditambahkan pada laptop dinamakan slot PCMCIA ( Personal Computer Memory Card International Association).**



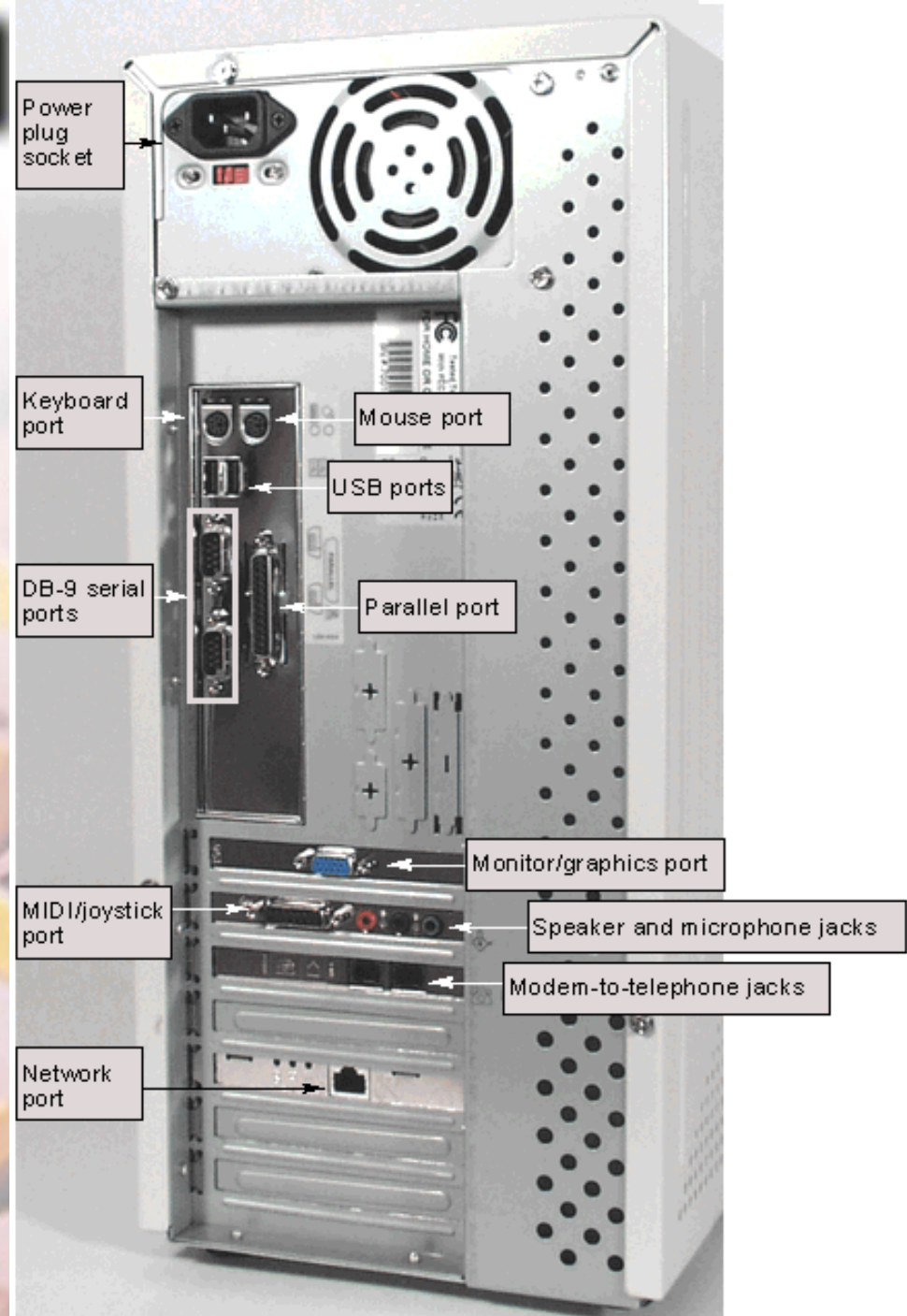


**Card NIC (network interface card), hard disk, atau card modem (modulation-demodulation) dapat ditambahkan pada laptop.**

# Dasar Komputer



**Untuk menghubungkan peralatan ekspansi, anda tinggal memasang kabel dari peralatan tersebut ke ekspansi port komputer.**





## Konektor-konektor

Terhubung ke  
Video port



VGA

DB-15

15 pins

Monitor

**LPT**



Parallel  
DB-25M

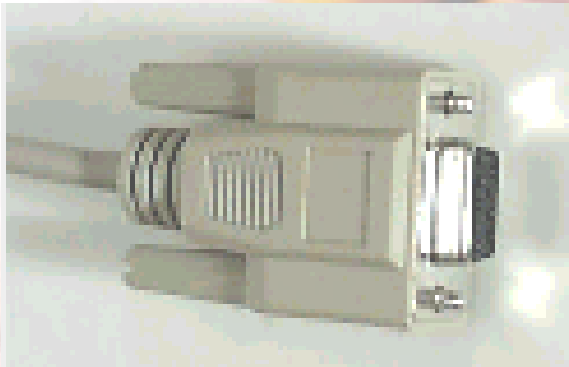
25 pins

Konektor ke port paralel yang dapat mengirim data secara simultan lebih dari 8 saluran pada kecepatan 12.000 kbps (kilobits per seconds)

Printer,  
external  
CD-ROM  
drive,  
external  
Zip,  
external  
hard drive.

Konektor ke port serial, yang mana dapat mengirim data pada kecepatan 56 kbps

Mouse  
or  
Modem



Serial  
DB-9  
  
9 pins

COM



## Konektor-konektor

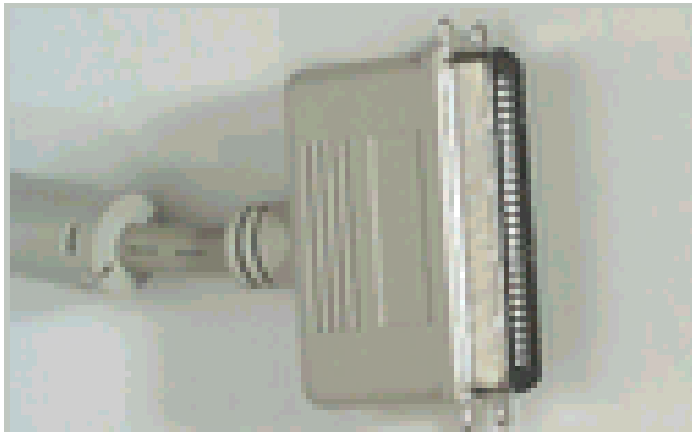
**Konektor ke port “FireWire” dengan kecepatan 400,000 Kbps**



IEEE 1394

**Video camera, dan external DVD drive**

## Konektor-konektor



SCSI  
C-50F  
50 pins

**Scuzzy**

**Konektor ke port SCSI, yang mana dapat mentransfer data secara simultan lebih dari 8 atau 16 saluran pada kecepatan antara 5 Mbps sampai 80 Mbps (Mega bits per second)**

**Dapat mensupport lebih dari 16 peralatan di dalam “bunga rantai””. Hard drives, scanner, CD-ROM, tape backup.**

## Konektor-konektor



USB

**Universal Serial  
Bus**

Modem, keyboard, joystick, scanner, dan mouse.

Konektor ke port USB, yang mana dapat mentransfer data dalam saluran tunggal pada kecepatan 12.000 Kbps

Mensupport lebih dari 127 peralatan



Terhubung ke port jaringan, yang mana dapat mentransfer data dengan kecepatan antara 10 sampai 100 Mbps

Intranet



RJ-45

- **Solid state, transistors dan diodes merupakan bangunan dari IC.**
  - RAM
  - ROM

- **Media Magnetik**
  - **Floppy disks**
    - 3.5”
    - 5.25”
  - **Hard disk**
  - **Zip Disk**
  - **Tape**
    - Digunakan untuk backup



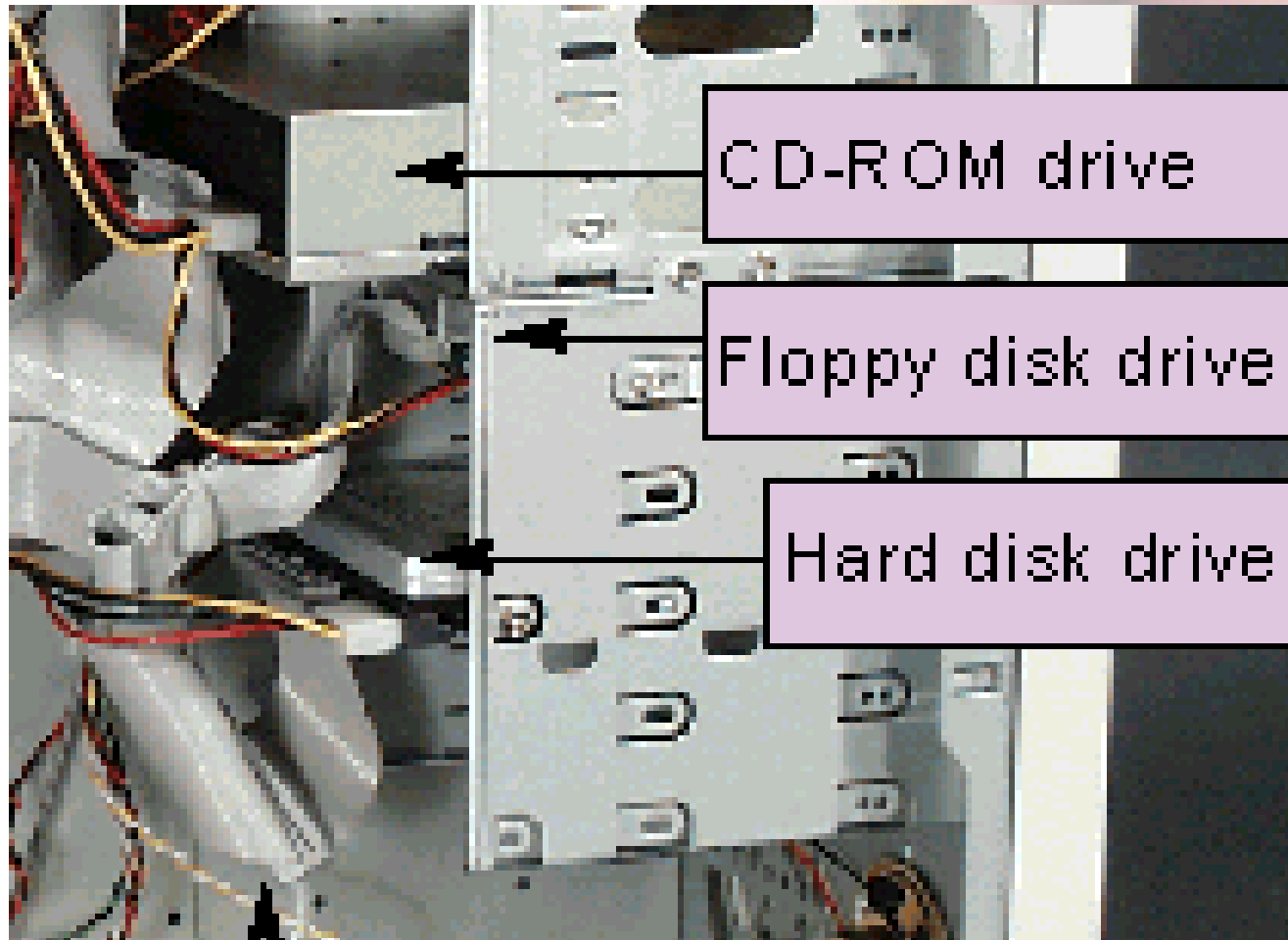
- **Media Optical**

- CD-ROM**

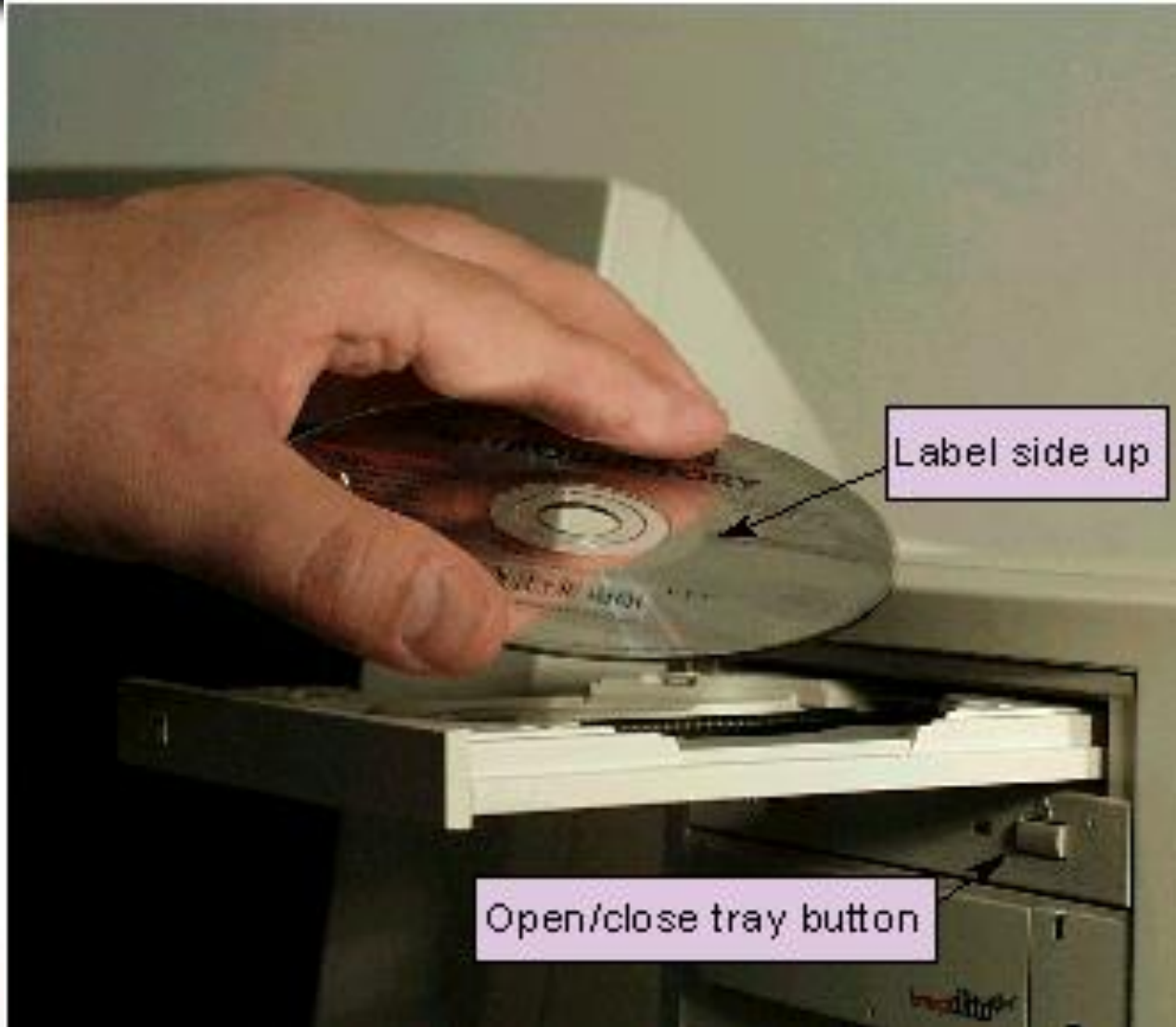
- compact disk - read only memory

- DVD**

- digital video disc atau digital versatile disc

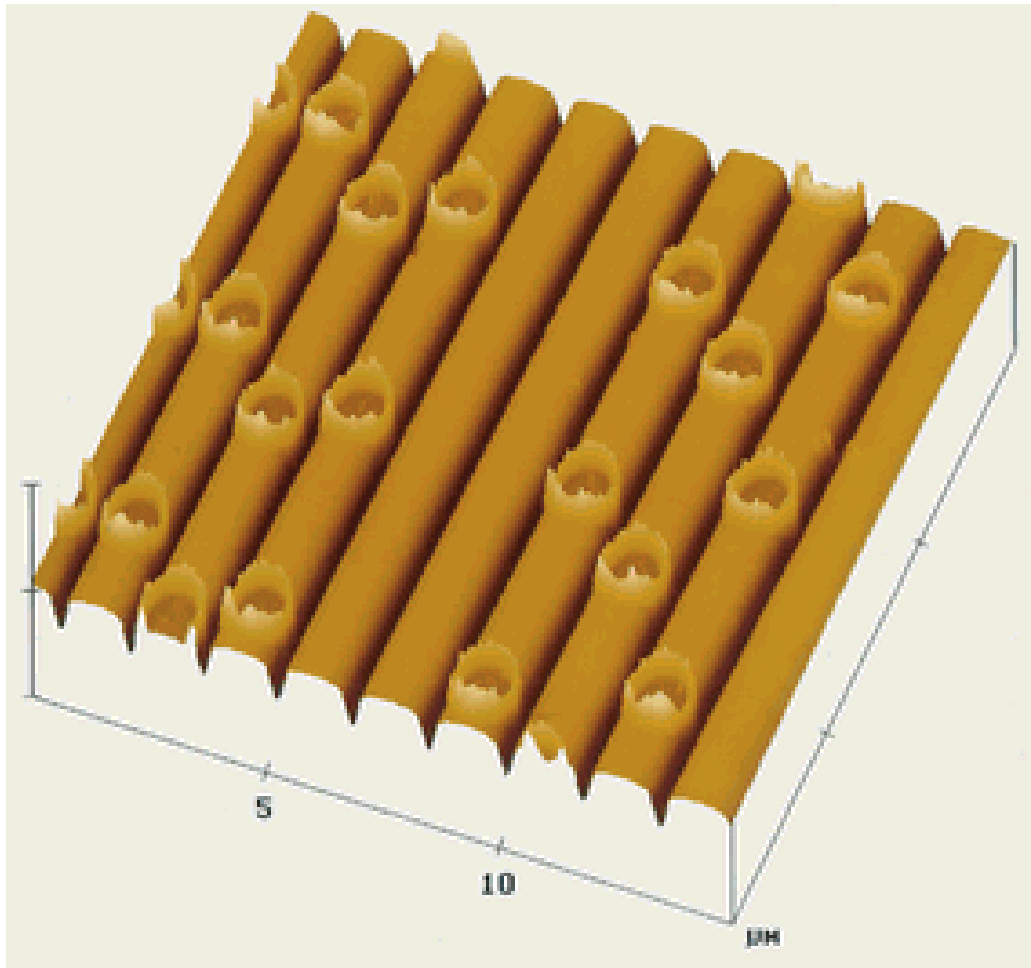


## Peralatan Media Magnetik



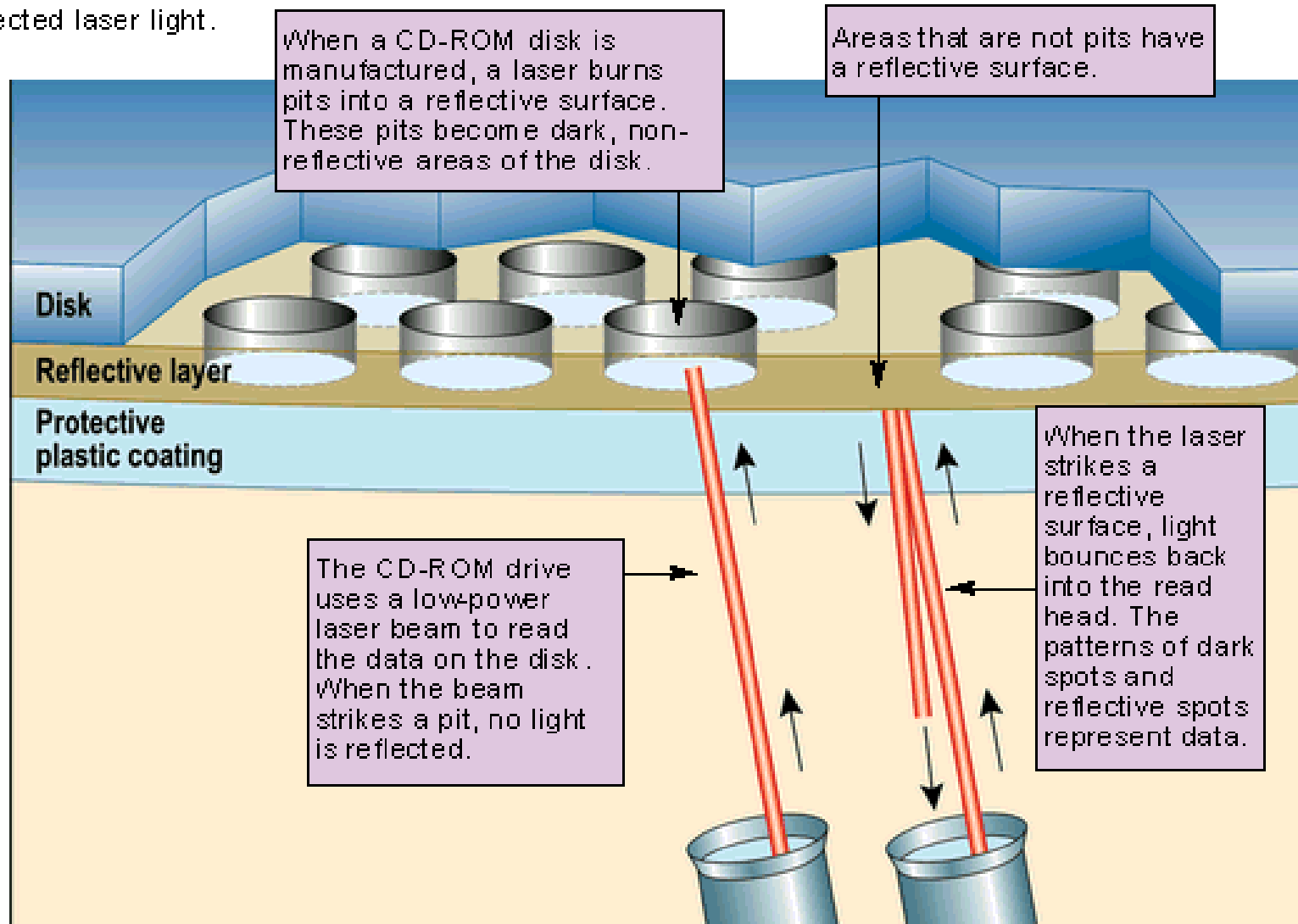
**CD-ROM (Compact disk - read only memory)**



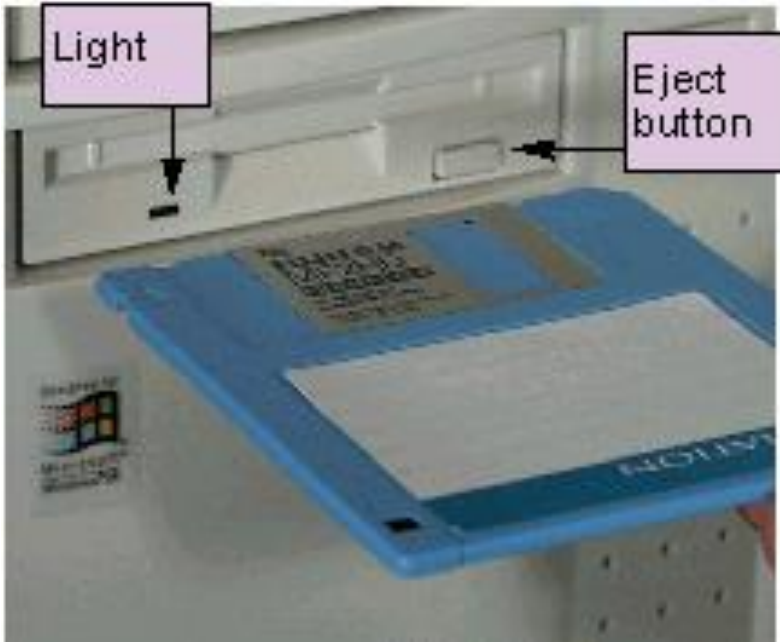


CD-ROM dan DVD mempunyai kesamaan konstruksi, DVD lajunya lebih rapat dan lubangnya lebih kecil.

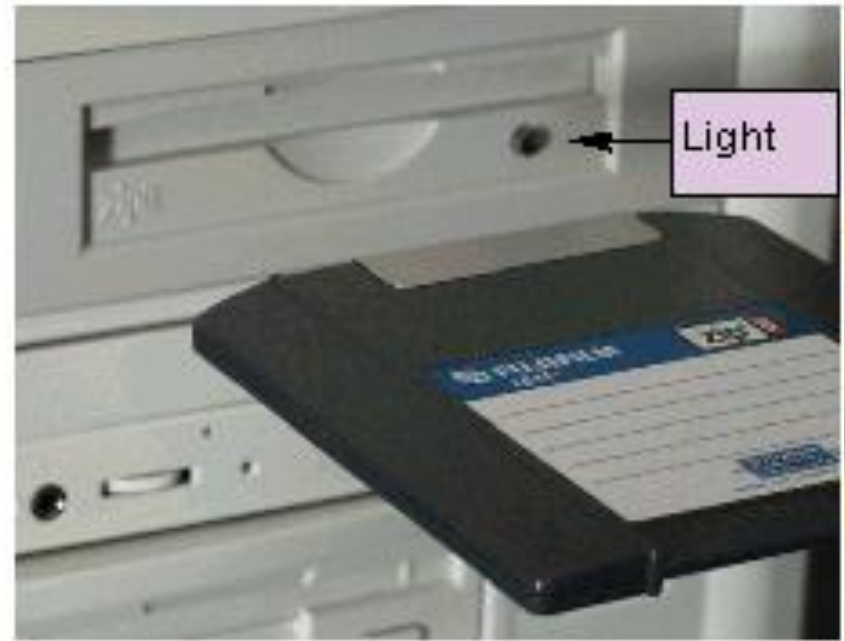
Optical storage devices read data using reflected laser light.



## Peralatan Transfer File



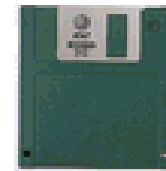
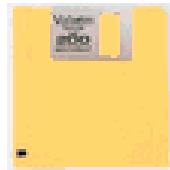
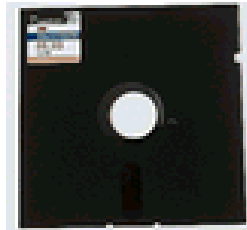
**Disk drive**



**Zip drive**



### Kapasitas Floppy dan Zip disk



<b>Size</b>	5 1/4"	3 1/2"	3 1/2"	3 1/2" Zip
<b>Density</b>	High	Double	High	N/A
<b>Capacity</b>	1.2 MB	720 KB	1.44 MB	100 MB
<b>Sectors per side</b>	15	9	18	32
<b>Tracks per side</b>	80	80	80	3,065

3½-inch floppy disk construction.

Only high-density disks have this high-density indicator hole.

A rigid plastic disk jacket protects the inner disk.

When the disk is inserted in a drive, the spring-loaded access cover slides sideways to expose the disk surface to the read-write head.

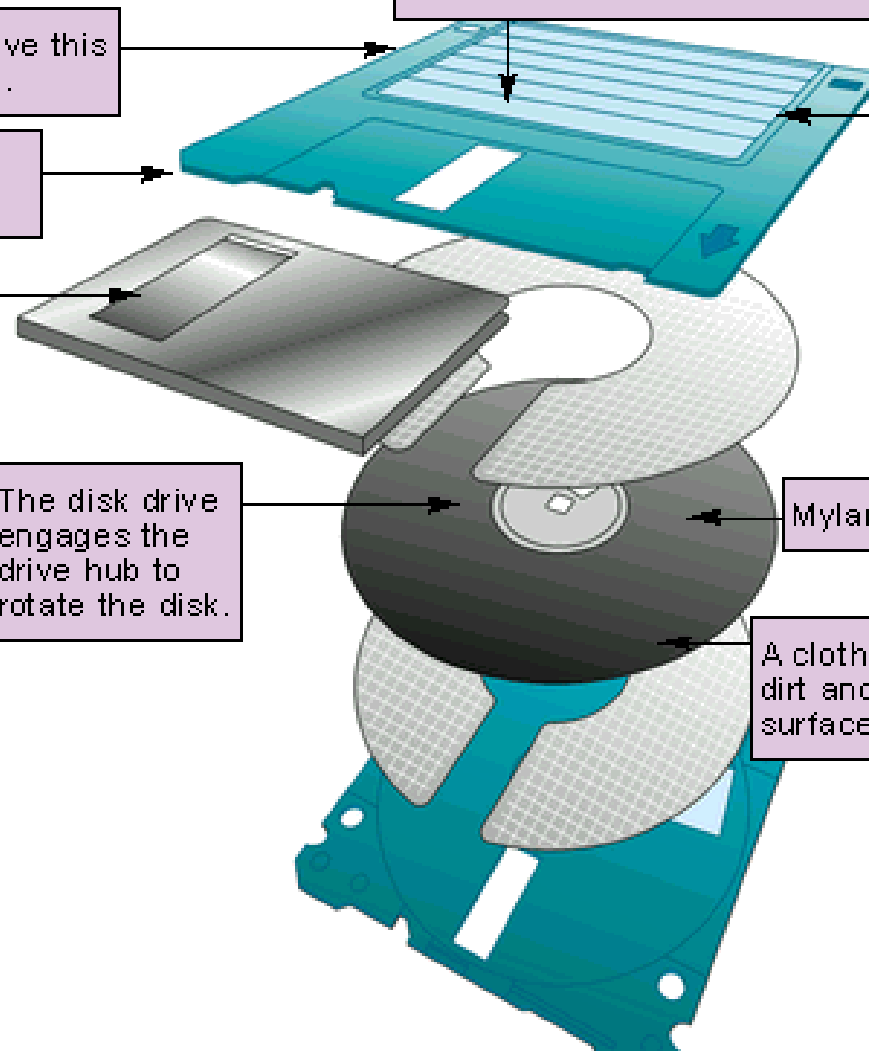
The disk drive engages the drive hub to rotate the disk.

The disk label often wraps around to the underside of the disk. When you affix the label, make sure it does not stick to the access cover.

When the write-protect window is open, the disk is write protected and the computer cannot write data on the disk. You usually keep the window closed so you can add, modify, and delete data on the disk.

Mylar "floppy" disk.

A cloth-like disk liner removes dirt and dust from the disk surface.



**A hard disk is located inside the system unit.**





The hard disk platters are stored inside the drive case or cartridge to prevent dust and other contaminants from interfering with the read-write heads.

The platter surfaces are formatted into cylinders and sectors. A cylinder is a vertical stack of tracks. To find a file, the computer must know the platter, cylinder, and sector, in which the file is stored.

Plat Hard disk menyimpan data sperti pada Flopy disk

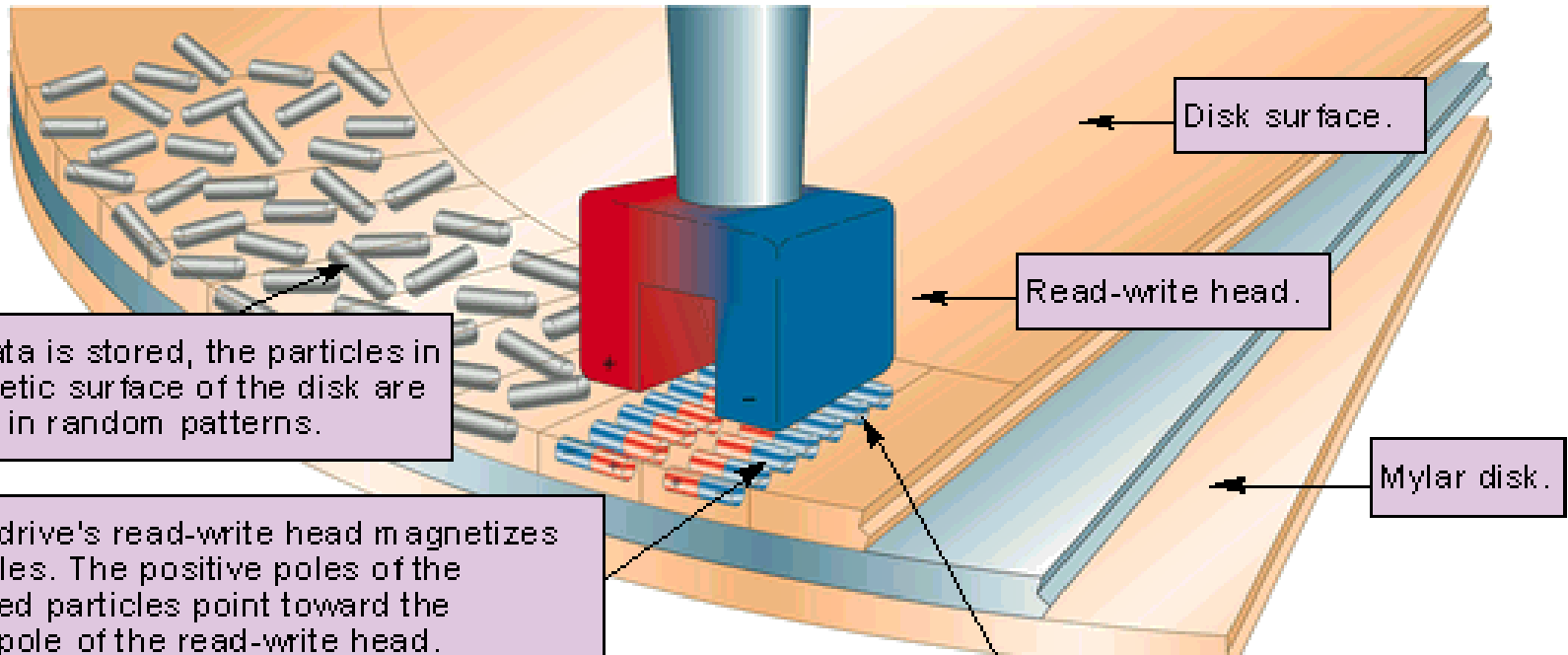
The drive spindle supports one or more hard disk platters. Both sides of the platter are used for data storage. More platters mean more data storage capacity. Hard disk platters rotate as a unit on the drive spindle to position a specific sector under the read-write heads. The platters spin continuously, making thousands of revolutions per minute.



Each data storage surface has its own read-write head, which moves in and out from the center of the disk to locate a specific track. The head hovers only a few micro inches above the disk surface, so the magnetic field is much more compact than on a floppy disk. As a result, more data is packed into a smaller area on a hard disk platter.

# Dasar Komputer

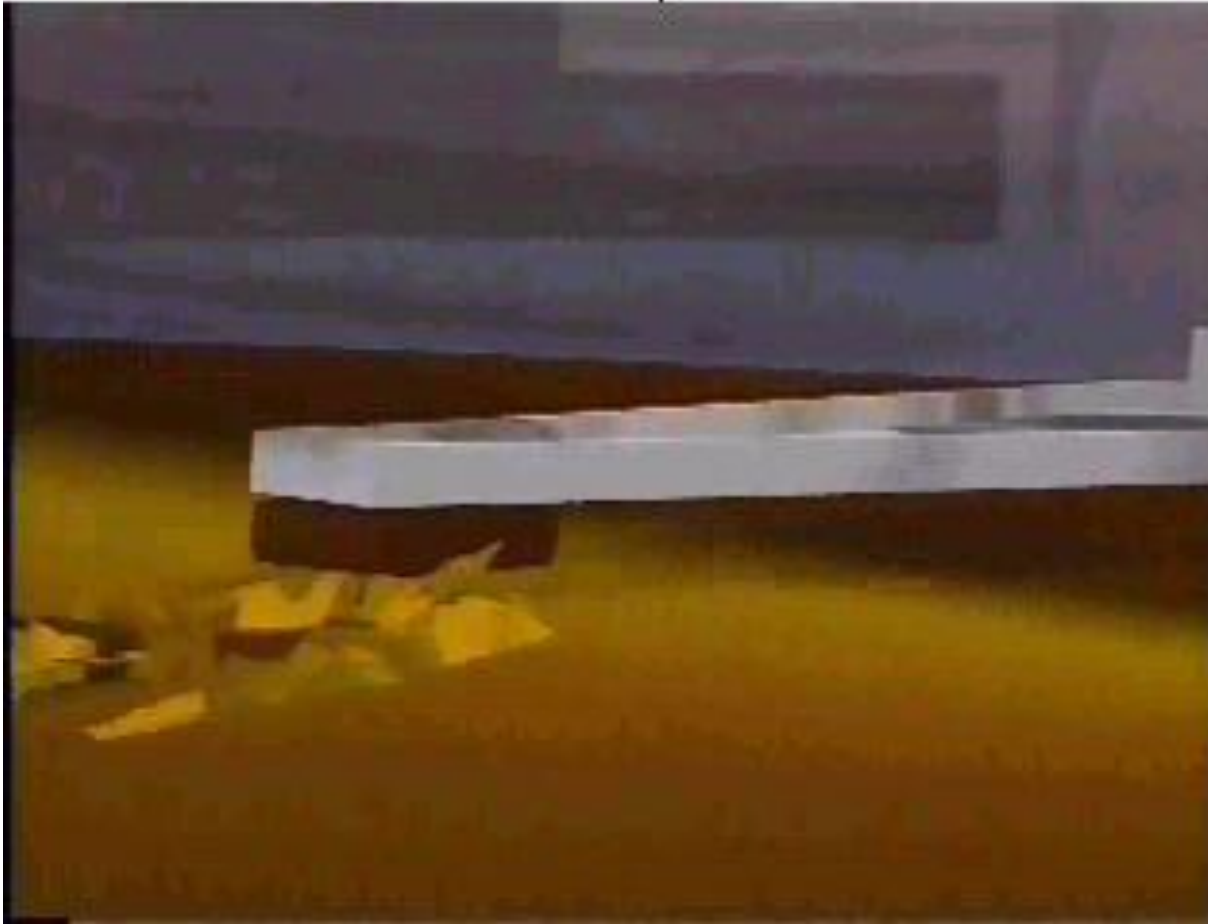
Storing data on magnetic media.



Before data is stored, the particles in the magnetic surface of the disk are scattered in random patterns.

The disk drive's read-write head magnetizes the particles. The positive poles of the magnetized particles point toward the negative pole of the read-write head.

The read-write head can reverse polarity to align the next row of particles in the opposite direction. The patterns of magnetized particles represent data.



**Lengan pembaca yang kasar atau debu pada permukaan dapat merusak Disk**



# Dasar Komputer

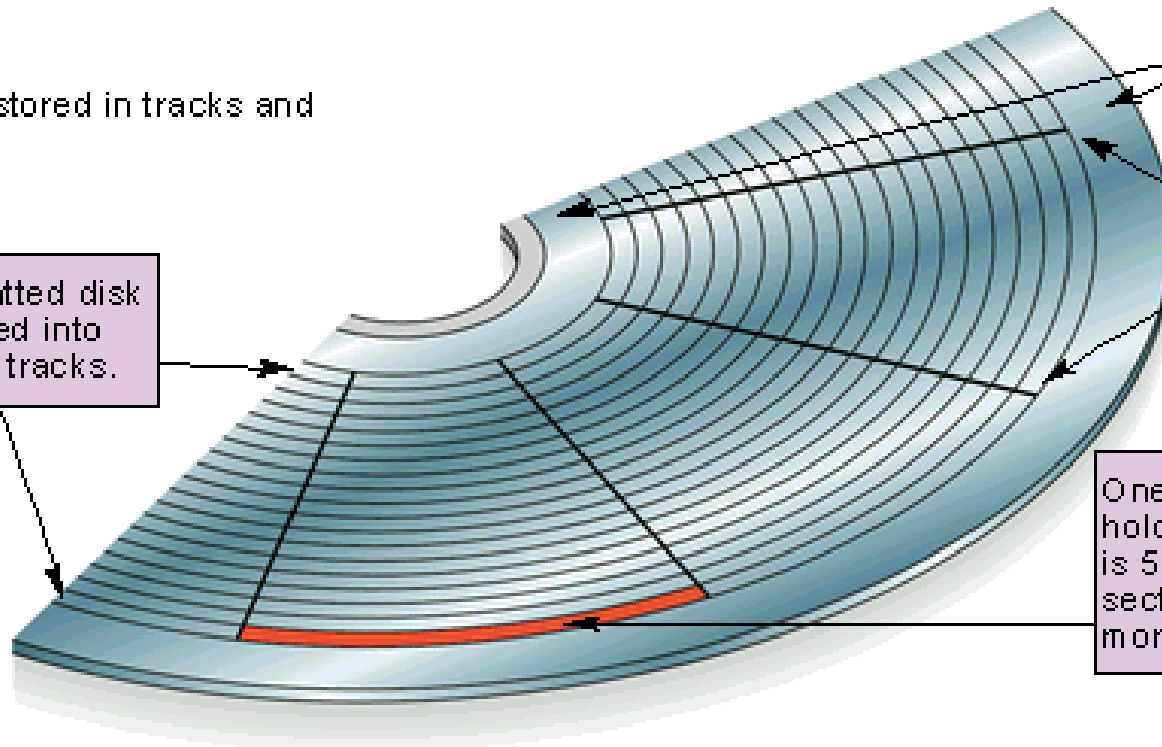
Data is stored in tracks and sectors.

A formatted disk is divided into circular tracks.

The outer and inner edges of the disk are not used for data storage.

Tracks are divided into wedge-shaped sectors.

One sector of a floppy disk track holds 512 bytes of data. A file that is 512 bytes or less fits in a single sector. Larger files are stored in more than one sector.



**Material substrat untuk floppy disks adalah a mylar (plastic).  
Material substrat untuk the Winchester atau hard drive  
sebagian besar aluminum.**

**A finely ground metal oxide (rust) dimasukkan pada material  
substrat sebagai media magnetic. Material yang sama  
seperti yang digunakan pada tape/kaset.**

# Binary System 2-an

**Satu angin  
dari darat.**

**Dua angin dari  
laut**







One lantern in the church tower signaled that the British were coming by land.



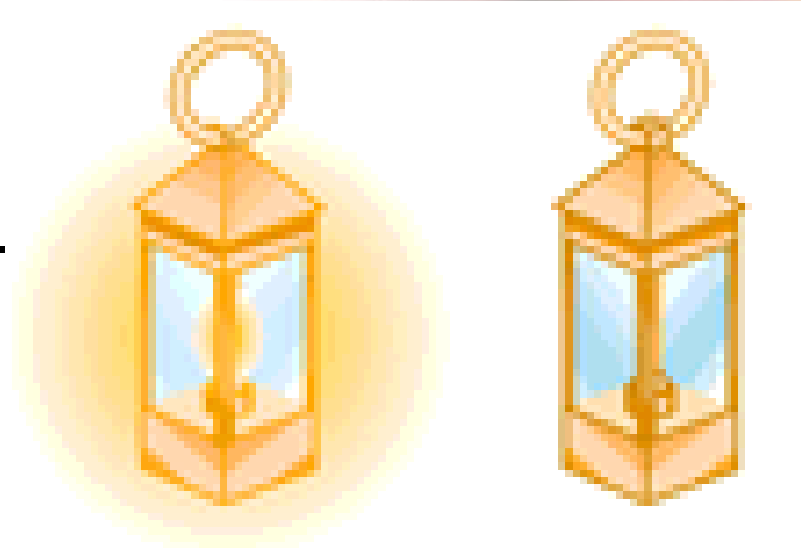
Two lanterns signaled that the British were coming by sea.

0 0  
Off Off



**Paul Revere segera tahu, jika semua lentera mati/off berarti the British tidak akan berlabuh**

1    0  
On   Off



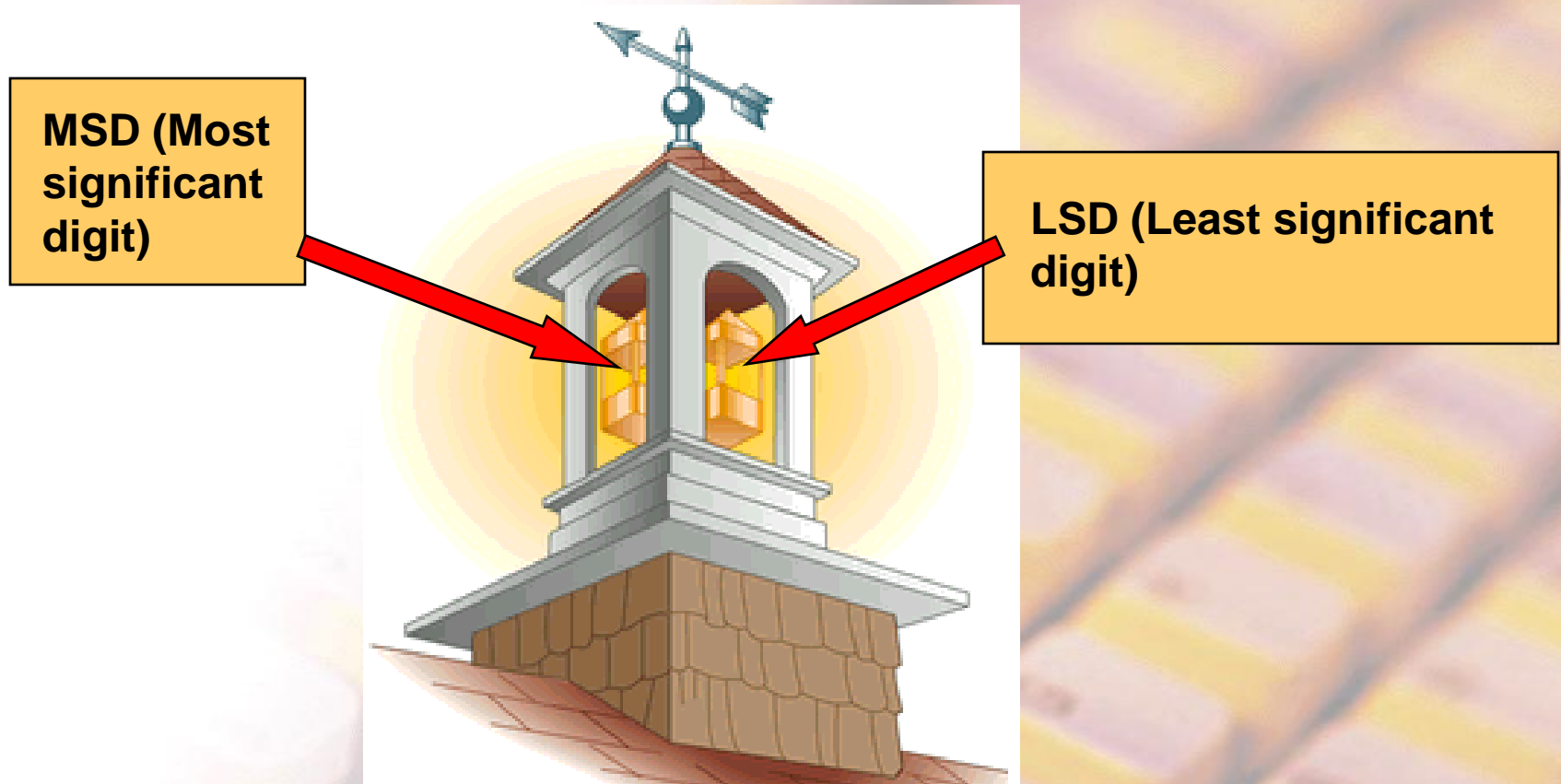
**Paul knew mengerti, jika satu lentera menyala/on maka the British akan berlabuh menggunakan angin darat.**



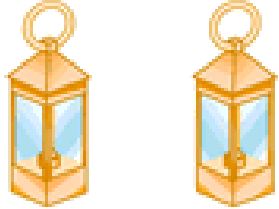

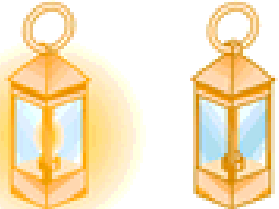

1 1  
On On



Paul knew mengerti, jika dua lentera menyala/on maka the British akan berlabuh menggunakan angin laut.



**Paul tidak menggunakan fungsi posisi dari kedua lentera (digits)**

<p>0 0 Off Off</p> 	<p><b>Message 1:</b> "The British aren't coming."</p>	<p>0 1 Off On</p> 	<p><b>Message 3:</b> "The British are coming by sea."</p>
<p>1 0 On Off</p> 	<p><b>Message 2:</b> "The British are coming by land."</p>	<p>1 1 On On</p> 	<p><b>Message 4:</b> "Some of the British are coming by land, but others are coming by sea."</p>

**Jika ia mengetahui / menggunakan fungsi posisi dari MSD dan LSD maka data biner yang didapat akan berisi lebih banyak informasi.**



$$2^0 = 1$$

$$2^1 = 2$$

$$2^2 = 2 \times 2 = 4$$

$$2^3 = 2 \times 2 \times 2 = 8$$

$$2^4 = 2 \times 2 \times 2 \times 2 = 16$$

$$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$$

$$2^6 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$$

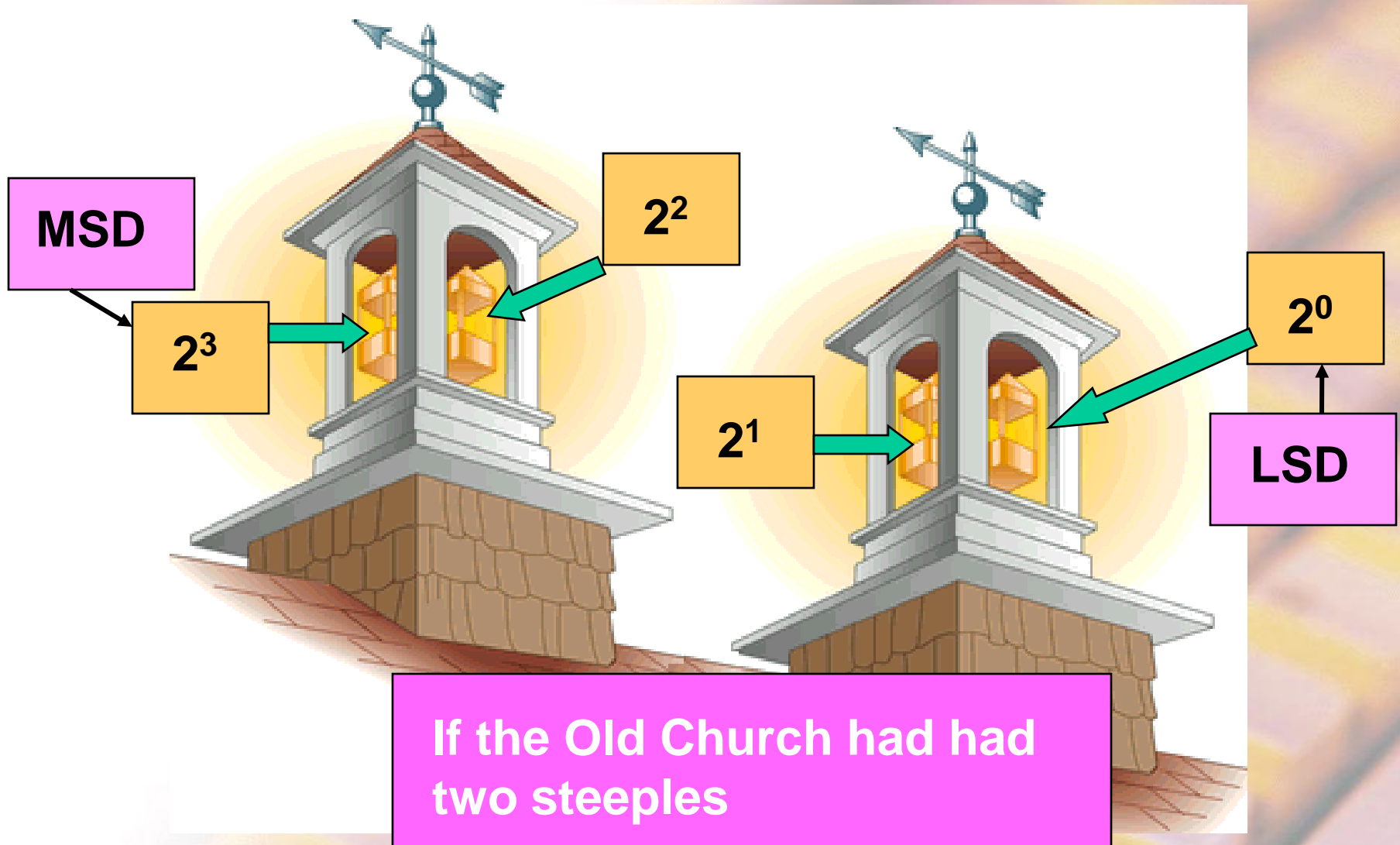
$$2^7 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$$

$$2^8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256$$

**Powers of two - lanterns  
on (1) off (0)**

**two possible states,  
thus the powers of two**

# Dasar Komputer



**Jumlah maksimum unit-unit yang berbeda dari informasi yang bisa kita konversikan dengan  $n$  bits adalah  $2^n$**



# Dasar Komputer

When you use  
one bit  
(one lantern)...



...you can convey  
two ( $2^1$ ) units  
of information.

0  
1

---

When you use  
two bits  
(two lanterns)...

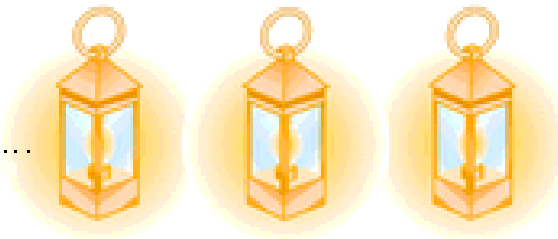


...you can convey  
four ( $2^2$ ) units  
of information.

00  
01  
10  
11

---

When you use  
three bits  
(three lanterns)...

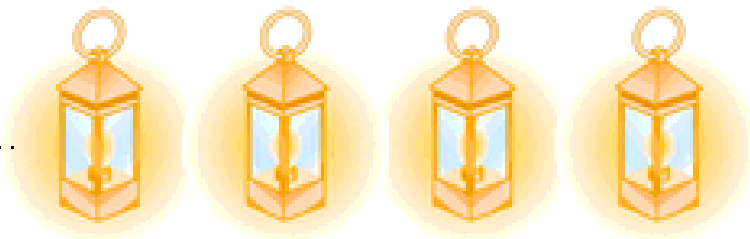


...you can convey  
eight ( $2^3$ ) units  
of information.

000 100  
001 101  
010 110  
011 111

---

When you use  
four bits  
(four lanterns)...

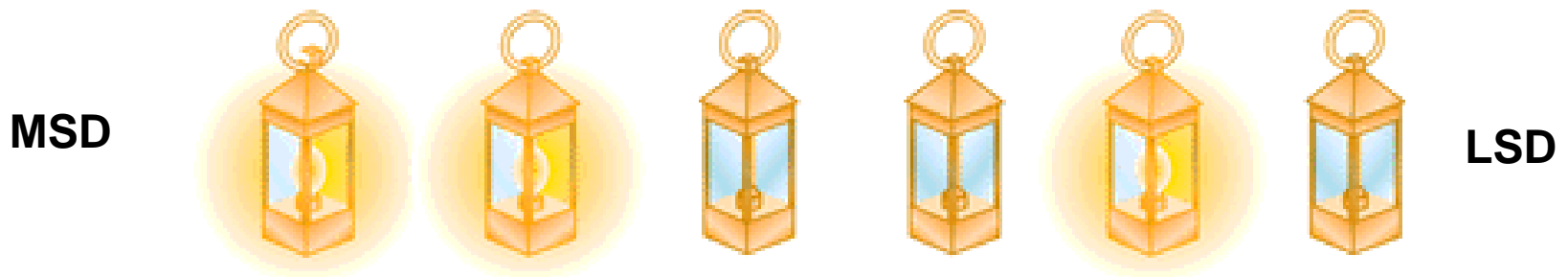


...you can convey  
sixteen ( $2^4$ ) units  
of information.

0000 0100 1000 1100  
0001 0101 1001 1101  
0010 0110 1010 1110  
0011 0111 1011 1111

**Empat bits data digital disebut sebagai “nibble”.**

**Six lanterns representing the number 50, if all six were lit then they would represent 63**



Binary digits	1	1	0	0	1	0
Place value	$2^5$ thirty-twos	$2^4$ sixteens	$2^3$ eights	$2^2$ fours	$2^1$ twos	$2^0$ ones
Binary to decimal conversion	$1 \times 32 + 1 \times 16 + 0 \times 8 + 0 \times 4 + 1 \times 2 + 0 \times 1 = 50$ (decimal)					

**Delapan bits data digital disebut sebuah “byte”,  
Bisa juga disebut sebuah word.**

**Ketika kita menekan kunci pada keyboard data ditransfer ke komputer menggunakan informasi biner digital dalam bentuk standard ASCII (American Standard Code for Information Interchange).**



# Dasar Komputer

1. Locate the lowercase letter "a" in the matrix.

2. Look at the top of the column to find the binary digits for the three leftmost bits.

3. Look across the row to find the binary digits for the four rightmost bits.

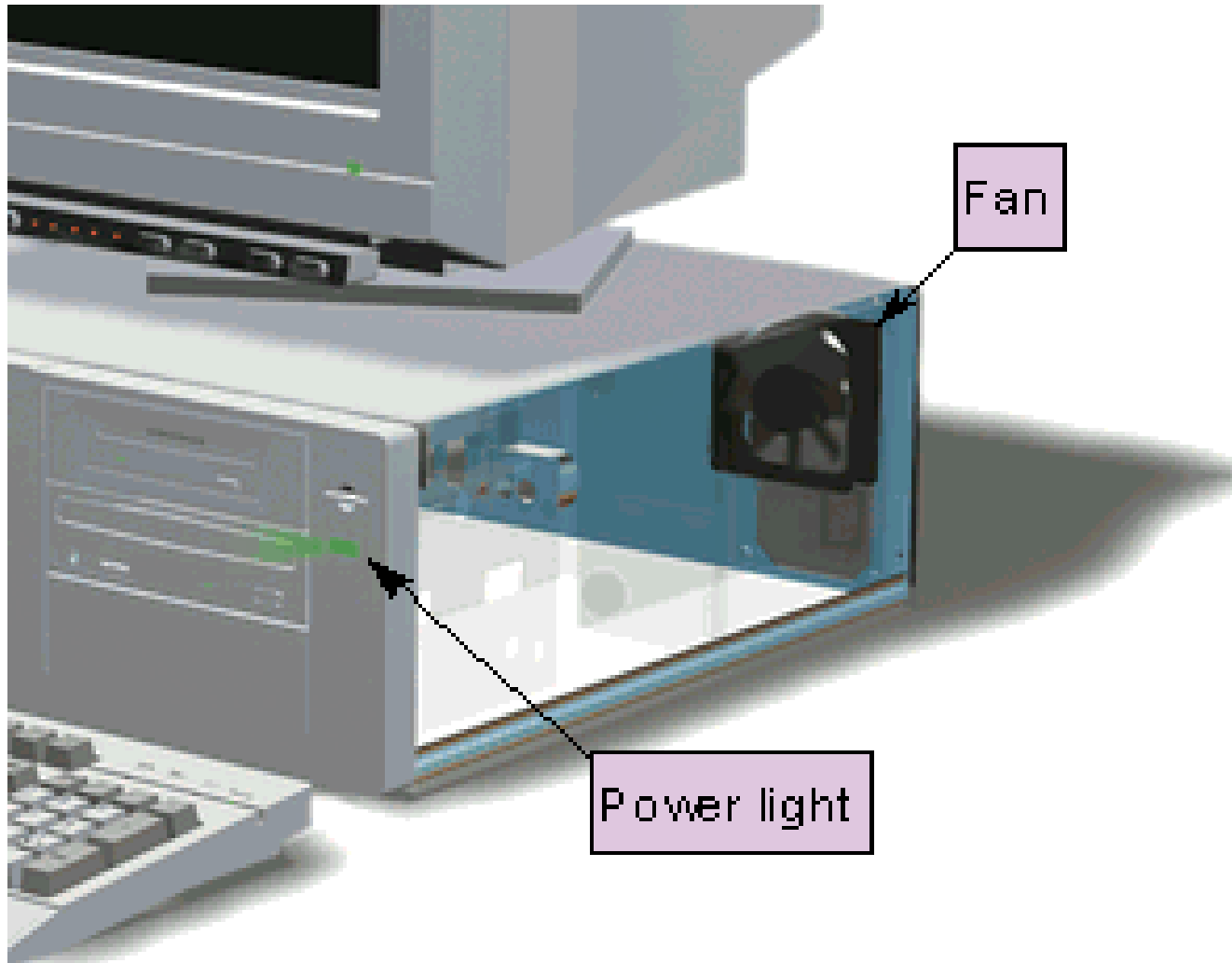
4. Combine the binary digits from the top of the column and the side of the row. The ASCII code for "a" is 110001.

	000	001	010	011	100	101	110	111
0000	NUL	DLE	SP	0	@	P		p
0001	SOH	DC1	!	1	A	Q	a	q
0010	STX	DC2	"	2	B	R	b	r
0011	ETX	DC3	#	3	C	S	c	s
0100	EOT	DC4	\$	4	D	T	d	t
0101	ENQ	NAK	%	5	E	U	e	u
0110	ACK	SYN	&	6	F	V	f	v
0111	BEL	ETB	'	7	G	W	g	w
1000	BS	CAN	(	8	H	X	h	x
1001	HT	EM	)	9	I	Y	i	y
1010	LF	SUB	*	:	J	Z	j	z
1011	VT	ESC	+	;	K	[	k	{
1100	FF	FS	,	<	L	\	l	
1101	CR	GS	-	=	M	]	m	}
1110	SO	RS	.	>	N	^	n	~
1111	SI	US	/	?	O	_	o	DEL

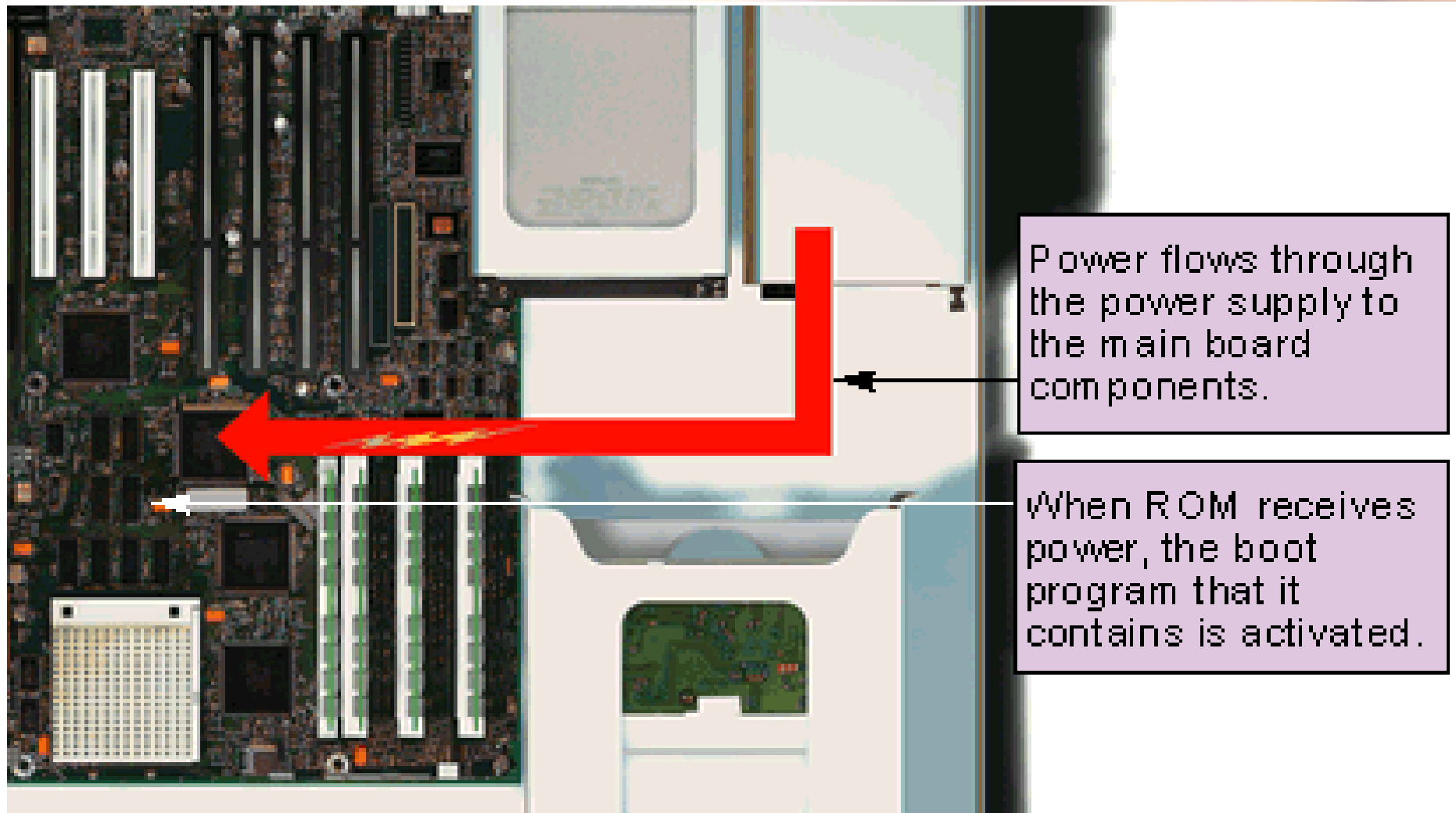
**Power on**

# Dasar Komputer

When you turn on a computer, you should see the power light and hear the fan.







**Tegangan 5volt and 12volt dari power supply digunakan untuk menghidupkan sistem.**

The power-on self-test checks system components.

1. The POST checks whether the graphics card is working.

2. All RAM addresses are tested to make sure that they can hold data.

4. The POST tests the hard disk and floppy disk drives.

3. The keyboard check makes sure that a keyboard is attached to the computer.

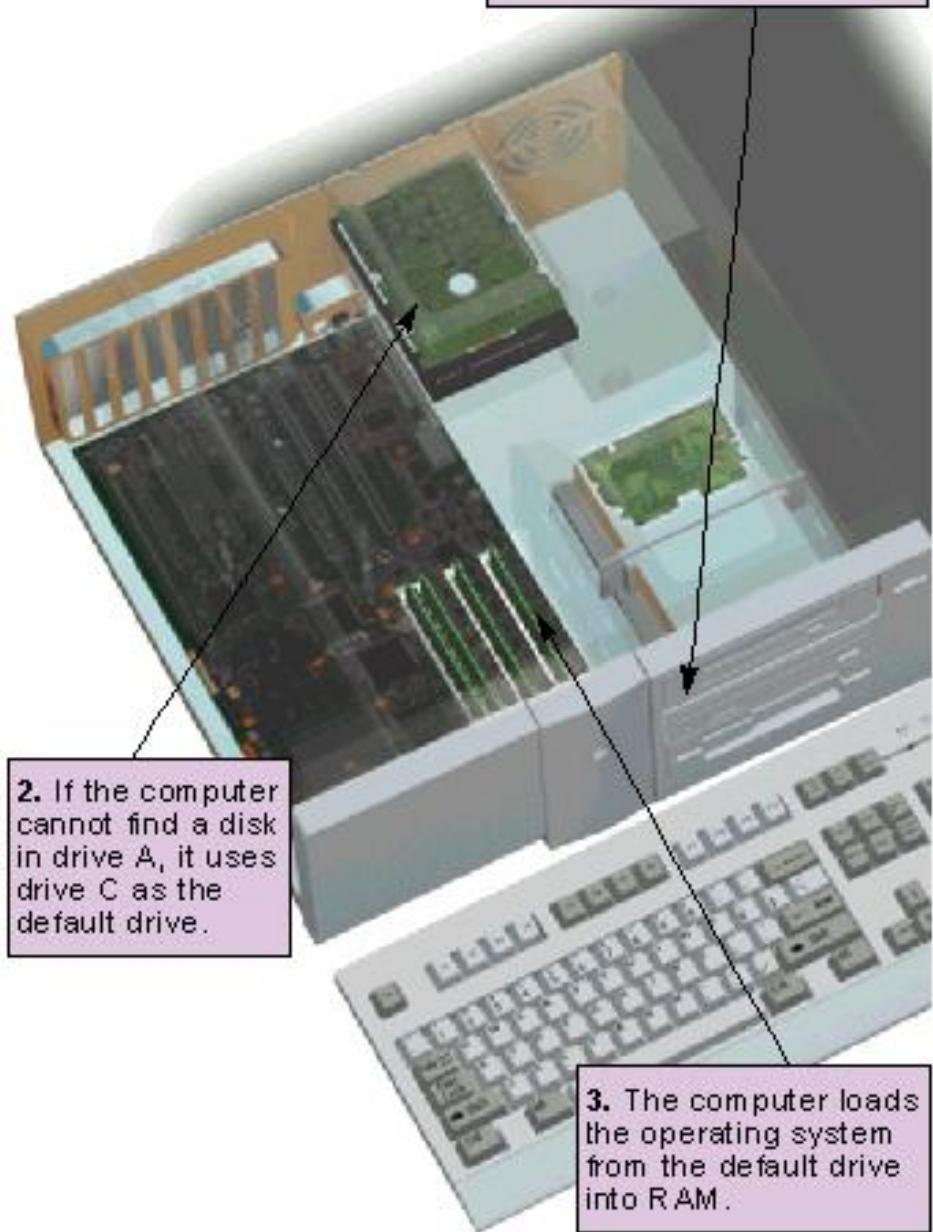
Loading the operating system .

1. If the computer finds a disk in drive A, that drive becomes the default drive.

2. If the computer cannot find a disk in drive A, it uses drive C as the default drive.

3. The computer loads the operating system from the default drive into RAM .

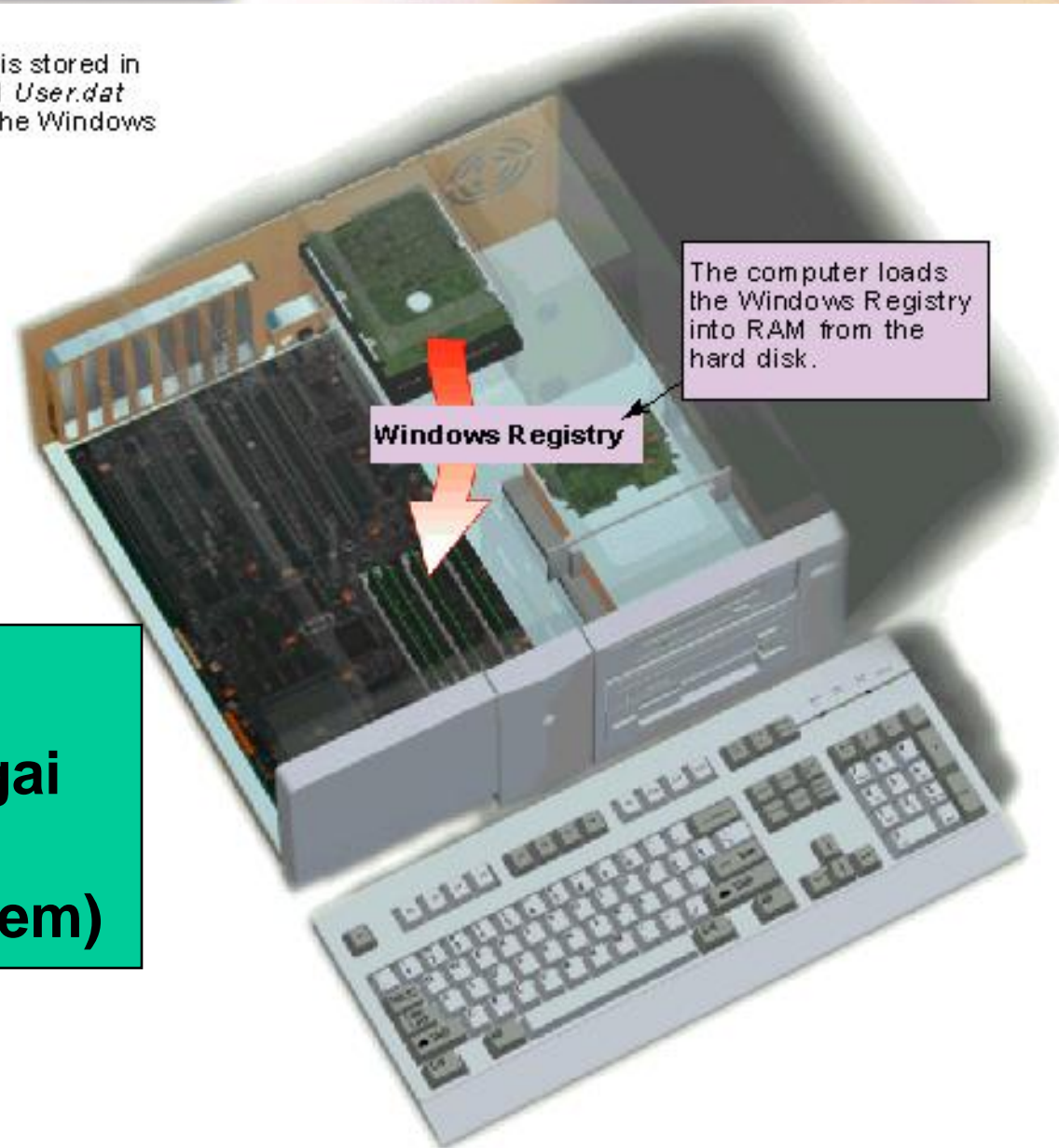
If you enter advanced BIOS the boot-up can be changed to "C"





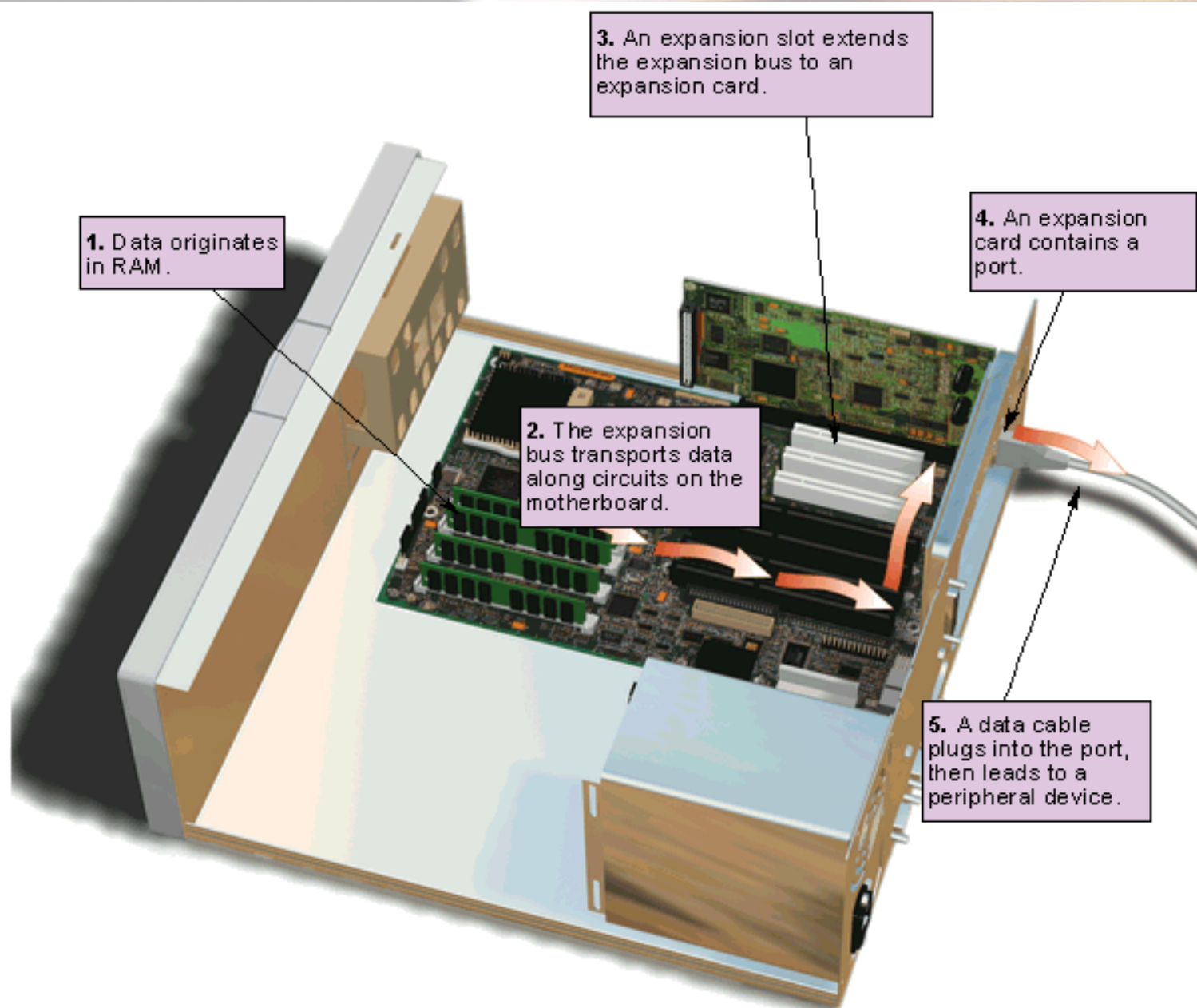
# Dasar Komputer

Configuration data is stored in the *System.dat* and *User.dat* files that make up the Windows Registry.



**Menggunakan  
Windows sebagai  
sebuah SO  
(operating System)**

# Dasar Komputer



**Terbanglah seperti  
burung, hingga bisa  
membaca arti dari apa  
yang kita lihat**

